THE IRON TRADE REVIEW

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Looking Forward to Year of Great Prosperity

Increasing Desire of Pig Iron Melters to Provide for Future Requirements—Railroads Quietly Placing Orders—Pig Iron Strong

The iron trade is already looking forward with confident expectation of prosperity continuing next year. Belief in future activity is strikingly illustrated by the greatly increased interest of pig iron consumers in covering for their requirements for the first half of 1913. Furnaces are, however, very cautious about selling into next year except at substantial advances. Pressure for delivery of finished materials continues extremely strong and premiums are paid with alacrity by many consumers who are unable to get deliveries on contracts fast enough to meet their needs. Further rail buying for next year's delivery is being done by railroads, principally by western systems. Two additional orders for western roads, aggregating 70,000 tons, have been placed with the Illinois Steel Co. Negotiations now pending are estimated to call for 350,000 to 400,000 tons. The prediction already is being made that next year will be a tremendous one in rails.

Pig Iron

With stocks of all kinds of pig iron slowly but surely declining, and with the melt of foundries gradually increasing, the position of the seller of pig iron is strong. Last month, stocks in the Alabama district declined about 8,000 tons and the total pig iron tonnage held by Alabama makers Aug. 1, was about 100,000. Eastern Pennsylvania stocks, during July, declined about 12,000 tons, and in Virginia, about 10,000 tons. In the middle western territory, the decline continues at the rate of about 30,000 tons monthly. A very significant feature of the pig iron market is the appearance of a leading eastern Pennsylvania consumer of basic asking prices for its requirements for the first quarter of 1913, for which period it needs about 45,000 tons. This company is at present enjoying great prosperity and evidently expects continuance of favorable conditions. Quotations on basic for first quarter delivery in the east will represent an advance of about 75 cents per ton over present quotations. In eastern territory, demand for foundry iron lags somewhat. The pig iron market is very active at Buffalo, where about 100,000 tons have been sold within a week and prices have been advanced. The United States Radiator Co. has purchased about 20,000 tons of foundry grades, largely for delivery at its plants at Geneva and Dunkirk. Bessemer is more active at Pittsburgh and a total of 7,500 tons has been sold to three consumers at $14.50, valley. On the 10,000 tons of Bessemer inquired for by the Algona Steel Co., Sault Ste. Marie, Canada, $15, valley, was quoted, but sale has not been made.

Signs of Prosperity

Jobbers and mills which are able to make prompt deliveries are doing a large business at handsome profits. Eastern mills are shipping plates and shapes hundreds of miles and frequently obtain from $6 to $8 per ton premium. Premiums are sometimes being paid on sheets also. Many jobbers are unable to give deliveries from their stocks in less than a week and are finding their stocks of some sizes depleted. The volume of business sent to its mills in July by one large independent concern in the Pittsburgh district was the heaviest in its history. Price advances in finished products during the week have not been general, but were usually due to individual initiative and gradually extended throughout the trade. This tendency is shown in quotations on plates in the Pittsburgh district, where mills are refusing to accept 1.30c and are having little difficulty in selling at from 1.35c to 1.40c, while even more is obtained for prompt delivery. Shafting is firm and higher prices are probable.

Shapes and Plates

The structural material market is remarkable for the large number of small projects. Few very large enterprises, requiring heavy tonnages, are in prospect. Bids are being received this week on 91,000 tons of steel for subway extensions of the Brooklyn Rapid Transit Co., for shipment over four years with an option of 60,000 tons additional. The new 36-story office building to be erected on the Equitable site, lower Broadway, New York, will require from 30,000 to 35,000 tons, and the new skyscraper of the Western Union Telegraph Co. will call for 10,000 tons. It is expected that the American Bridge Co. will get both the Equitable and Western Union buildings. The orders on the books of coast shipyards are more numerous than at any time since the Spanish-American war.

Railroad Buying

Some further buying of electric rails in trial lots is being done by leading systems. The New York Central has placed 5,000 Mayari Bessemer rails with the Pennsylvania Steel Co. Car buying continues, but builders are showing a disposition to withhold announcements. Haskell & Barker have taken 3,500 for a western road and the steel requirements, about 35,000 tons, go to Chicago mills.

PITTSBURGH

Prices Tending Upward---Pig Iron Strong

Office of THE IRON TRADE REVIEW,
2148-49 Oliver Bldg., Aug. 13.

New orders for nearly all lines of finished steel products continue to be heavy and are equal in volume to those of the first half of last month in practically all branches of the industry. Specifications against contracts have not fallen off, and present indications have led the trade to believe that August will equal the preceding month in volume of business. During the past week there has been a noticeable tendency among both the leading interest and the most prominent independent manufacturers to prevent a too rapid rise in the market, it being conceded that buying will be restricted if price values are too high. Effort is being made to block any movement to force the market upward at this time. The pig iron market continues active and prices are firm on the recently established basis. Nearly all the available iron has been disposed of and stocks are low, particularly in the valley region. Inquiries for all grades are numerous, and an early advance in values is predicted by some. It no longer is possible to place orders for plates at less than 1.35c to 1.40c for shipment the remainder of the year, and some of the smaller independent plate makers are asking 1.40c as a minimum.

Pig Iron.—The pig iron market is practically controlled by the furnace operators, who have had no difficulty in obtaining the increased prices that went into effect about a week ago. In no sales reported the past week have prices been shaded, the tendency being toward higher values. There is very little available iron to be sold for the remainder of this quarter and a large number of valley furnaces have no stock to offer for fourth quarter delivery. Inquiries for Bessemer iron during the last few days have exceeded those for other grades, one dealer having sold 7,500 tons of Bessemer to three consumers in the district, each calling for 2,500 tons, at $14.50, valley, or $15.40, Pittsburgh. Basic is not offered below $14, valley, and it is impossible to obtain gray forge at less than $13.50, valley, an offer of this price having been refused several days ago. Both basic and No. 2 foundry are firm at $14, valley. Early in the week, an inquiry for 10,000 tons of Bessemer, for immediate delivery, was received from the Algoma Steel Co., Sault Ste. Marie, Can. A quotation of $15, valley, was made, but it has not been accepted.

The Rebecca furnace of the Kittanning Iron & Steel Co., at Kittanning, Pa., which has been out of blast the last year, was relighted Aug. 10, and will operate on foundry iron for several weeks, but will run on basic thereafter. The Kittanning company does not expect to offer iron for sale until better prices are obtainable.

Pig iron quotations for prompt and future shipments are as follows:

(Prompt Shipment.)

Bessemer, valley	$14.50
Bessemer, Pittsburgh	15.40
Basic, valley	14.00
Basic, Pittsburgh	14.90
No. 2 foundry, Pittsburgh	14.90
Gray forge, Pittsburgh	14.40
Malleable, Pittsburgh	14.90

(Fourth Quarter.)

Bessemer, valley	$14.50
Bessemer, Pittsburgh	15.40
Basic, valley	14.00
Basic, Pittsburgh	14.90
No. 2 foundry, Pitsburgh	14.90
Gray forge, Pittsburgh	14.25
Malleable, Pittsburgh	14.90

Ferro-Alloys.—Small sales of ferro-manganese have been made the past week. The demand is light, owing to the fact that the majority of the consumers in this district have covered for requirements for this year, and in some instances the first half of 1913. On extended contracts the prevailing price continues to be $51, Baltimore, although $52 is asked for prompt delivery. A sale of 100 tons of German ferro-manganese at $50 is reported by one of the local sellers. Ferro-silicon, 50 per cent, is quoted at $72.50 for both prompt and forward shipments. Shipments in both manganese and silicon are deferred several weeks.

We quote 80 per cent ferro-manganese at $52, Baltimore, for prompt delivery and $51 for forward shipment. The freight rate from Baltimore to Pittsburgh is $1.95 per ton.

Fifty per cent ferro-silicon is quoted nominally at $72.50, Pittsburgh, for prompt and forward delivery; 12 per cent, $22; 11 per cent, $21; 10 per cent, $20, f. o. b. Globe, Jisco and Ashland furnaces. The freight rate to Pittsburgh is $1.90. The foreign grades are held at $1 or more a ton over domestic prices.

On ferro-titanium we quote 8 cents per pound for carload lots; 10 cents per pound for 2,000 pound lots and over, and 12½ cents per pound in lots up to 2,000 pounds.

Plates.—Mills in this district are refusing to accept 1.30c for plates for future delivery, and in most instances quotations run between 1.35c and 1.40. La Belle Iron Works, Steubenville, O., withdrew its 1.30c quotation some time ago, and has found no difficulty in obtaining increased values in prices. The Carnegie Steel Co. and the Jones & Laughlin Steel Co. are quoting 1.35c on all large tonnages. Several other plate makers have refused to accept orders at less than the maximum quotation, and in several instances as high as 1.50c and 1.55c are noted for small tonnages for delivery within the next three or four weeks. Although there has been no extensive car buying the past week, new orders continue in good volume, and mills are more and more deferred in shipments. In some cases, shipments are deferred from 60 to 90 days. Several eastern mills have been asking premium prices on plates, but such is not the case so far as the most important plate makers in this territory are concerned.

Plates are quoted at the following prices:

Tank plates, ¼ inch thick, 6¼ to 100 inches, 1.35c to 1.40c. Extras are as follows per 100 pounds: Boiler and flange steel plates, 0.10c; A. B. M. and ordinary firebox steel plates, 0.20c; still bottom steel, 0.30c; marine steel, 0.40c; locomotive firebox steel, 0.50c; all sketches excepting straight taper plates varying not more than 4 inches in width at ends, narrowest end being not less than 30 inches 0.10c; circles, 0.20c. Plates in widths over, 100 inches up to 110 inches 0.05c; over 110 inches up to 115 inches, 0.10c; over 115 inches up to 120 inches, 0.15c; over 120 inches up to 125 inches, 0.25c; over 125 inches up to 130 inches, 0.50c; over 130 inches, 1c. Gages under ½ inch to and including $\frac{7}{16}$-inch plate on thin edge, 0.10c; under $\frac{7}{16}$ and including No. 9, 0.25c. Five cents extra for less than carloads. Terms net cash in 30 days.

Sheets. — All of the sheet mills in this district are operating at full capacity, but the output falls far below the demand, shipments being more deferred each week. Leading makers refuse to promise deliveries

for galvanized sheets in less than eight or nine weeks, and are seven and eight weeks behind in the delivery of blue annealed and black sheets. There is considerable talk in the trade that blue annealed sheets will be advanced $1 a ton in the near future. In fact, at least one Ohio mill is now selling at 1.50c, an advance of $1. One of the leading independent makers of sheets is practically out of the market for the remainder of the year. Any weakness that prevailed in galvanized sheets has entirely disappeared, makers now being able to obtain 3.15c without difficulty, and it is reported that mills are unable to make a profit on galvanizing operations because of the high price for spelter. For fourth quarter, some mills are asking 3.20c. Although there has been some inquiry for sheets for next year's delivery mills have showed no desire to enter into contracts beyond this year. It is believed August will equal the record sheet production of last month.

Black, blue annealed, galvanized and roofing sheets are firm, but unchanged, at the following prices:

Flat Sheets.

Black Sheets.—Nos. 10-12 gage, $1.70 per 100 pounds; Nos. 13-14 gage, $1.75; Nos. 15-16 gage, $1.80; Nos. 17-21 gage, $1.85; Nos. 22-24 gage,$1.90; Nos. 25-26 gage, $1.95; No. 27 gage, $2.00; No. 28 gage, $2.05; No. 29 gage, $2.10; No. 30 gage, $2.20.

Tin mill sizes base 5 cents per 100 pounds under these prices.

Blue Annealed.—Nos. 3-8, $1.40 per 100 pounds; Nos. 9-10, $1.45; Nos. 11-12, $1.50; Nos. 13-14, $1.55; Nos. 15-16, $1 65.

Galvanized.

Nos. 10-11 gage, $2.15 per 100 pounds; Nos. 12-14 gage, $2.25; Nos. 15-16 gage, $2.40; Nos. 17-21 gage, $2.55; Nos. 22-24 gage, $2.65; Nos. 25-26 gage, $2.85; No. 27 gage, $3.00; No. 28 gage, $3.15; No. 29 gage, $3.25; No. 30 gage, $3.45.

Roofing Sheets.

Net extras on all gages per 100 pounds. Corrugated 2-inch, 2½-inch, 3-inch and 5-inch corrugation, 5c; 2 V crimped without sticks, 5c; corrugated 1¼-inch corrugation, 10c; 3 V crimped without sticks, 10c; pressed standing seam with cleats, 15c; plain roll roofing with or without cleats, 15c.

Painted Roofing.

12 to 18 gage, inc., 5c; 19 to 24 gage, inc., 10c; 25 to 28 gage inc., 15c.

Tin Plate.—There is every indication that August easily will equal the banner record of last month in the tin plate trade. The volume of new business continues heavy and unusually large shipments are being made to the can factories for the canning trade. It is conservatively estimated this year's output of the tin plate mills will exceed that of last year by at least 20 per cent. Tin plate has been firmly established at the prevailing quotation and considerable talk of an advance of 10 cents a box continues to be heard in the trade. One of the notable features in the tin plate industry is the falling off of imports and the growth of exports. The following quotations continue:

Coke tin plate, 100-pound basis, 14 x 20, $3.50, f. o. b. mill, Pittsburgh district.

Rails and Track Material. — Specifications against contracts for standard and light steel rails continue heavy, and bookings this week indicate that there is considerable buying for emergency purposes. The contract period for this year's rails has ended, but as yet roads in this immediate territory have not entered the market for next year's material. Traction companies have been buying rather heavily for immediate needs. Reports to the effect that western roads have already placed orders for large tonnages have led mills in this district to believe that rail buying for 1913 will commence at an early date in all territories. Open-hearth rail mills have enough tonnage on their books to keep them running at capacity until December and in some cases until the early part of next year, and the Bessemer rail mills are in a similar position. Work on the extension to the Edgar Thomson mill, which will permit it to make open-hearth rails with its own steel, is being rushed, and it is probable the addition will be completed by May 1, 1913. There has been a tremendous demand for spikes, both railroads and jobbers specifying heavily. Jobbers' stocks are exceedingly low, and shipments are even more deferred than they were last month, it being impossible to get deliveries in less than two or three months. There has been some inquiry for standard spikes for 1913 delivery, but mills have refused to sell.

Rails are quoted as follows, with the base price on open-hearth standard sections, 1.34c per pound at the mill:

Fifty-pound and heavier, 1.25c per pound; carloads and less than 500 tons, 1.34c per pound; light rails on base weight of 40 to 45 pounds; 1.19c, the schedule on the other weights being irregular and subject to negotiations; angle bars for standard sections, 1.50c, Pittsburgh; track bolts, 2.00c to 2.10c, Pittsburgh.

Railroad Spikes.

4½, 5 and 5½ and 9-16	$1.65 to 1.70
3, 3½, 4, 4½ and 5 x ½	.10
3½, 4 and 4½ x 7-16	.20
3, 3½, 4 and 4½ x ⅜	.30
2½ x ⅜	.40
2½, 3 and 3½ x 5-16	.60
2 x 5-16	.80

Billets.—There is a noticeable scarcity of all grades of semi-finished material, and in some instances the situation is acute. Most of mills are well covered for the remainder of the year, but some consumers underestimated their requirements and have had to enter the market for additional tonnages. Three of the largest manufacturers of billets have no surplus tonnage to offer, and are out of the market. Bessemer billets would be difficult to obtain at less than the maximum quotations. A sale of open-hearth sheet bars at $24, Pittsburgh, was reported this week.

Bessemer 4 x 4 billets with 0.25 carbon and less are quoted at $22 to $22.50, with the usual extra for size and analysis, and open-hearth rolling billets, $23 to $23.50. Bessemer sheet and tin bars are quoted at $22.50 to $23.00, and open-hearth sheet bars are quoted at $23.50 to $24.00, f. o. b. Pittsburgh and Youngstown for third quarter, with full freight to destination added. Forging billets are quoted at $28.00 to $29.50, Pittsburgh.

Hoops and Bands. — Demand for steel hoops and bands continues heavy, and mills are getting as high as $1.45 and $1.50 for hoops, although they are regularly quoted at $1.40. Bands, too, have brought higher prices, several sales at $1.30 being reported where early delivery was possible. There has been no official change in prices, however, and we continue to quote as follows:

Hoops in carload lots, 1.40c, Pittsburgh; in less than carload lots, 1.50c; bands 1.25c, base, with net extras, as per standard steel.

Merchant Bars. — Thus far this month specifications against contracts have exceeded those of July, and new tonnage is being booked at an equally heavy rate. It no longer is a question of price for bars, but rather one of delivery. Mills have been particularly careful to prevent speculative tonnage being entered upon their books, and are canceling all unspecified contracts at the close of each month. Common iron bars are quoted at 1.40c to 1.45c, Pittsburgh. Shafting has been firmly established on the basis providing 64 per cent off for carload lots and 59 per cent off for less than carload lots. Iron and steel bar quotations follow:

Common iron bars, 1.40c to 1.45c, Pittsburgh; Bessemer and open-hearth steel bars, 1.25c; plow and cultivator, 1.25c; channels, angles, zees, tees, under 3 inch, 1.25c, all f. o. b. mill. The following differentials are maintained on steel: Less than 2,000 pounds of a size, 0.35 advance. Cold rolled, and ground shafting, 64 per cent off in carloads and 59 per cent in less than carloads, delivered in base territory.

Muck Bar. — Practically no muck bar is being offered, most of the producers consuming their output in the finishing mills. Quotations are nominally given at $30 to $31, Pittsburgh, for all grades of pig muck bar.

Structural Shapes. — Fabricators in this district are optimistic regarding existing conditions and the outlook. One of the best seasons since 1907 is being experienced, and it is estimated

that present quotations for construction work are from 25 to 35 per cent higher than those obtainable six months ago. Although no particularly large projects have been undertaken locally, the volume of business has been large in the aggregate. Deferred mill shipments have caused considerable embarrassment on the part of fabricators and erectors. Among undertakings figured on at present in this district are: A new foundry for Dodge Bros., Detroit, calling for 200 tons of steel; two small buildings for the International Harvester Co. at Chicago, calling for about 120 tons, and the St. Francis hotel, San Francisco, requiring 2,000 tons. Local fabricators continue to receive good bookings, and present contracts will keep their mills busily engaged for the next three months. The following prices are firm, but unchanged:

Beams and channels, 15 inches and under, zees, 1.30c to 1.35c; tees, 1.30c to 1.35c; angles, from 3 to 6 inches 1.30c to 1.35c; over 6 inches, 1.40c to 1.45c; universal and sheared, 1.35c to 1.40c; over 15 inches, 1.40c to 1.45c; plates, 6¼ inches wide and wider, 1.40c to 1.45c.

Merchant Pipe.—All the mills in this district, including those of the leading interest and the independent manufacturers, are from six to eight weeks behind on pipe deliveries, and in some instances shipments are deferred 10 weeks, depending upon size. Mills are running at full capacity, although they are handicapped to some extent because of the labor shortage. Iron oil country goods have been advanced one point by some of the makers, although this increase in value is not general. Several iron pipe makers are asking $2 a ton above the regular card prices, and a general increase in value is expected. The Standard Oil Co. has closed a contract with a mill in this district for 20 miles of 14-inch gas line pipe for a Pennsylvania line and the Huntington Gas & Development Co., Huntington, W. Va., has closed for 20 miles of 12-inch line pipe with a local mill for a natural gas line to be laid into Huntington.

Discounts to jobbers, subject to the usual preferential discount to the large buyer, are as follows:

Iron and Steel Pipe Basing Prices.

	Steel.		Iron.	
	Butt weld.			
	Black.	Galv.	Black.	Galv.
⅛, ¼ inch	72	52	68	48
⅜ inch	73	63	69	53
½ inch	76	66	72	59
¾ to 1½ inch	79	71	75	64
2 to 3 inches	80	73	76	65
	Lap weld.			
2 inches	77	70	72	63
2½ to 4 inches	79	72	74	66
4½ to 6 inches	78	70	73	65
7 to 12 inches	76	66	71	61
13 to 15 inches	53	..	47	..
	Extra Strong, Plain Ends.			
	Butt weld.			
⅜, ¼, ⅛ inch	68	58	65	55
½ inch	73	67	70	63
¾ to 1½ inch	77	71	74	65
2 to 3 inches	78	72	75	66
	Extra Strong, Plain Ends.			
	Lap weld.			
2 inches	74	68	71	63
2½ to 4 inches	76	70	74	66
4½ to 6 inches	75	69	72	65
7 to 8 inches	68	58	65	55
9 to 12 inches	63	53	60	50
	Double Extra Strong, Plain Ends.			
	Butt weld.			
½ inch	63	57	60	52
¾ to 1½ inch	66	60	63	55
2 to 3 inches	68	62	65	57
	Double Extra Strong Plain Ends.			
	Lap weld.			
2 inches	64	58	61	52
2½ to 4 inches	66	60	63	57
4½ to 6 inches	65	59	62	56
7 to 8 inches	58	52	55	45

Plugged and reamed pipe is furnished at 2 points higher price, either butt or lap weld.

The above discounts are for full weight pipe, subject to a variation of 5 per cent, merchant pipe, when specified, being furnished up to 6 inches at one point higher discount (lower price).

Boiler Tubes. — One of the most important makers of boiler tubes in this district is practically out of the market. Buying continues heavy and mills are all the way from 10 to 12 weeks behind on shipments. The recent increase on charcoal iron tube values has been established without difficulty. One of the Pittsburgh makers is asking $2 above the regular quotations for charcoal, although this price is by no means general. Official discounts are as follows:

	Steel	Iron
1½ inch	59	47
1¾ to 2¼ inch	59	48
2½ inch	65½	53
2¾ to 3¼ inch	70½	55
3½ to 4½ inch	73	58
5 and 6 inch	65½	..
7 to 13 inch	63	..

To destination east of Mississippi river will be sold at delivered discount for carloads lowered by 2 points, for lengths 22 feet and under; longer lengths, f. o. b. Pittsburgh. Usual extras to jobbers and boiler manufacturers.

Wire. — Although an advance in common wire products has been expected the past week, quotations remain unchanged. One of the features of this market is the brisk buying at this season of the year, but this is not unprecedented, as the heavy September demand came in May several years ago. Quotations on wire products are proportionately lower than those on other finished material, and increases in values are expected. Prevailing prices are as follows:

Wire nails, jobbers' carload lots, $1.60 to $1.65; retailers' carload lots, $1.65 to $1.70; cut nails (western makers), jobbers' lots, $1.60 to $1.65, painted barb wire, jobbers' carload lots, $1.65 to $1.70; retailers' carload lots, $1.65 to $1.70, with 30c for galvanizing; plain wire to jobbers in carloads, $1.40 to $1.45; and to dealers, in carloads, $1.45 to $1.50; polished staples, $1.60 to $1.65; galvanized staples, $1.90 to $1.95.

Wire Rods.—Wire rods are strong at prevailing prices. One of the leading independent makers of rods has withdrawn from the market, having no surplus to offer. Specifications against contracts continue heavy. Bessemer rods are quoted at $26 and open-hearth rods at $27, Pittsburgh.

Coke.—Inquiries for furnace coke, aggregating from between 60,000 to 80,000 tons monthly, have come out in this territory during the past week. Idle blast furnaces are feeling the market for fuel to carry them through the remainder of the year, and considerable inquiry has come from furnaces that failed to cover fully earlier in the year. Sellers have hesitated about accepting offers for contract coke, although it is reported that some of the Uniontown dealers have closed contracts at $2.25, for fuel for the remainder of the year. Furnace coke continues to be quoted at $2.25 to $2.30, ovens, and foundry coke is selling at $2.60 to $2.75, ovens. According to the Connellsville *Courier* the coke production of the Connellsville district for the week ending Aug. 3 was 379,157 tons, compared with 315,723 tons the previous week, an increase of 63,434 tons. Shipments increased by 1,992 cars. The increase in output was divided almost equally between furnace and merchant ovens. We quote:

Connellsville furnace	$2.25 to 2.30
Connellsville furnace contract	2.25 to 2.35
Connellsville foundry	2.60 to 2.75
Connellsville foundry contract	2.60 to 2.75

Old Material.—The local iron and steel scrap market has remained quiet the last week. Dealers report that they are able to dispose of almost any tonnage at existing quotations, but find difficulty in obtaining much material at present prices. There has been but little disposition on the part of scrap dealers to sell, although the steel and rolling mills have had little difficulty in covering requirements. Steel and rolling mills are well supplied with material, and it is not probable the market will become active for several weeks. No changes in price are noted. We quote gross tons, delivered in the Pittsburgh district, including Steubenville, Brackenridge, and Follansbee, as follows:

Heavy melting scrap	$13.50 to 13.60
Rerolling rails	14.25 to 14.50
Malleable	12.75 to 13.00
Bundled sheet scrap	12.00 to 12.50
Iron axles	22.00 to 22.50
Old iron rails	15.50 to 16.00
Stove plate	10.00 to 10.50
No. 1 wrought scrap	14.00 to 14.25
Old car wheels	13.75 to 14.00
Low phosphorus	16.00 to 16.25
Machine shop turnings	10.75 to 11.00
Cast borings	10.00 to 10.25
No. 1 cast scrap	13.25 to 13.50

CHICAGO

Extremely Heavy Specifying---Pig Prices Higher

Office of THE IRON TRADE REVIEW,
1328 Monadnock Blk., Aug. 13.

Contrary to the expectations of some western producers, specifications in finished lines are continuing unabated and in some cases at an increasingly high rate. Notably is this true of merchant bars, the indications being that specifications for that material during August will equal the high rate attained in previous months. The market for both plates and sheets is very strong, the plate mills remaining practically out of the market and no sheet business being actively sought. The structural situation as to deliveries is getting worse daily and many small contracts are being filled entirely out of store.

Pig Iron.—Western producers are now uniform in quoting $15.50 for both No. 2 foundry and malleable Bessemer and lower prices are rapidly disappearing from the market. During the past week, a large volume of business in these grades was done on a basis of $15, f. o. b. local furnace, and strong Chicago interests which have been adhering to the lower quotation have advanced to $15.50, the advance taking effect this morning. The demand for all grades in this district is increasing and no difficulty in maintaining the advance is expected. Malleable Bessemer is exhibiting the only evidence of weakness on account of heavy purchases during the previous week, the larger users in this territory being well covered. Inquiry for the first quarter of 1913 is strong and considerable iron has been sold for delivery at that time at a 50-cent premium, or $15.50, f. o. b. local furnace at former quotations. Today's advance establishes $16 as the price for first quarter iron. Southern iron continues strong on a basis of $12, Birmingham, and producers report a better average of sales in this territory. A sale to a northern Illinois melter of 500 tons of southern foundry for last quarter delivery was made yesterday and an inquiry from a local consumer for a similar tonnage has appeared. Southern furnaces are not as yet in the market for 1913 delivery, several good tonnages offered on a basis of $12.50, Birmingham, having been refused recently.

The following prices represent the market for Chicago delivery for the remainder of the year, except northern foundry and malleable Bessemer, which are quoted f. o. b. local furnaces.

Lake Superior Charcoal	$16.25 to 16.75
Northern foundry No. 2	15.50
Southern foundry No. 2	16.35
Southern Silv'ries, 5 per cent sil.	17.40
Jackson co. silv'r's 8 per cent	18.40
Malleable Bessemer	15.50
Alabama basic	16.35

Billets.—Premiums continue to be offered freely for prompt delivery of billets in this market, but, as the situation remains practically unchanged, such business cannot often be placed. The continuation of pressure on the mills in finished lines offers no hope of a betterment in the billet market and while prices remain unchanged, they are very firm at the current quotations. We quote, open-hearth forging billets, $31; rerolling billets, $27.50.

Merchant Bars.—Contrary to expectations in some quarters, specifications for merchant bars are showing no decrease and some producers report indications of an August tonnage equal to that for previous months. The quotation of 1.35c on iron bars has disappeared and the market is very firm at a minimum of 1.40c. Some independent producers remain firm in their quotation of 1.45c and it is understood that some business has been placed at that figure. With the exception of increases in specifications there is no change in the steel situation, the market being firm at 1.48c. The excessive demand for material out of store has caused an advance in steel bars to 1.80c.

We quote, f. o. b. Chicago, as follows:

Bar iron, 1.40c to 1.45c, hard steel bars, rerolled, 1.35c to 1.40c; soft steel bars, bands and small shapes, 1.48c; hoops, 1.53c; smooth finished machinery steel, 1 inch and larger, 1.78c; shafting 64 per cent off list for carload lots, 59 per cent off for less than carloads.

On iron and steel from local stock we quote as follows:

Bar iron, 1.75c per pound base; soft steel bars, 1.80c per pound base; soft steel hoops, 2.05c, full extras.

Structural Material.—The small shops in this territory are finding it impossible to handle their contracts on mill shipments and are depending almost entirely on the warehouses. The latter are farther behind and are unable to promise delivery under two weeks and that conditional upon possible stock shortage. The recent large purchases have exhausted the supply of beams in certain sizes in this district and smaller contractors are being badly hampered. The western mills are taking no new business and while a material cessation of specifications is expected in some quarters, the common practice of buying for future requirements will probably keep up the average. The Minnesota Steel & Machinery Co. has taken 3,500 tons from the Great Northern railway for a new station at Minneapolis.

The total of structural contracts placed during the week is light, amounting to 5,997 tons, including the following: American Bridge Co., 126 tons from the E. B. Lamman Co., for building purposes at East Chicago; McClintic-Marshall Construction Co., 694 tons from the state board of harbor commissioners, pier No. 26, San Francisco; Des Moines Bridge & Iron Works, 120 tons from the Utah Light & Railway Co., extension to Salt Lake City power house; Mosher Mfg. Co., 443 tons from the Southern Methodist University for a new building, Dallas, Tex.; Hansel-Elcock Co., 120 tons from Griess-Pfleiger Tanning Co., power house; Kansas City Structural Co., 335 tons from Sebastian S. Kersge, storage building, Kansas City Mo. Other contracts include 113 tons by the Kansas Chemical Mfg. Co. for a building at Hutchinson, Kan.; 388 tons by the International Harvester Co. for an addition to its forge shop and 158 tons by Sears, Roebuck & Co. for manufacturing building No. 1 at Chicago. The latter will be constructed of reinforced concrete.

We quote mill prices, f. o. b. Chicago, as follows:

Beams and channels, 15 inch and under, 1.53c. For extras, see Pittsburgh report.

Store prices are as follows:

All angles, 3 inches and larger, including 6 inches, $1.90 per 100 pounds; angles over 6 inches, $1.95 per 100 pounds, base; beams, 3

to 15 inches, inclusive, $1.85 per 100 pounds, base; channels, 3 inches and larger, $1.85 per 100 pounds, base.

Rails and Track Fastenings.—Inquiries from the western railroads for 1913 requirements are appearing in even greater numbers. It is evident that the railroads will profit by their recent experiences and buy early and generously for future requirements. Considerable difficulty is being experienced in this district in obtaining track fastenings in sufficient quantities, the demand for the latter having increased greatly in the past few weeks. The excess tonnage in track fastenings is due in part to the increasing consumption of tie plates. The mills in this territory are still refusing 1913 business. Inquiries from western roads aggregating close to 200,000 tons have recently appeared and the Kansas City, Mexico & Orient has ordered 13,500 tons of rails from the Pennsylvania Steel Co.

We quote, light rails, f. o. b. Chicago, and track fastenings, f. o. b. Joliet, as follows:

Light rails, carloads, 25 to 45-pound, 1.20c to 1.25c; 16 to 20-pound, 1.25c to 1.30c; 12-pound, 1.30c to 1.35c; 8-pound, 1.35c to 1.40c.

Light section relayers, 45 pounds and under, subject to inspection, $21 to $23; standard section relaying rails, subject to inspection, $22 to $23.

Track fastenings, f. o. b. Joliet, angle bars, 1.50c; railroad spikes, 1.75c to 1.80c, smaller size spikes, 1.70c base; track bolts with square nuts, 2.10c to 2.15c, base.

Plates.—Congestion in plate mills is on the increase and specifications continue to be far in excess of the productive capacity. The only business that can be placed in the west consists of very small tonnages for which an occasional opening is found. Premiums are offered for prompt shipment, but can be placed only in isolated instances. The situation offers little possibility of relief from present conditions. Store prices on plates have advanced to 1.90c. The Illinois Central is in the market for 30 cabooses and the Kanawha & Michigan has ordered five passenger cars from the Pullman Co. The Grand Trunk has ordered 2,000 30-ton box cars from the Pressed Steel Car Co. and 50 tank cars from the American Car & Foundry Co., and the Chicago, Milwaukee & St. Paul has ordered 500 refrigerator cars from the last named builder and is in the market for 21 postal cars.

We quote, f. o. b. Chicago, as follows:

Tank plates, ¼ inch thick, 6⅝ to 100 inches wide, 1.53c. For extras, see Pittsburgh report.

Store prices are as follows:

Tank steel, ¼ inch and heavier, up to 72 inches wide, $1.90.

Sheets.—Some independent producers in this territory are practically out of the market and none are seeking business actively. Very little business can be placed for the remainder of the year and the additional demand upon the warehouses has resulted in an advance in quotations uniform with that in other lines. Jobbers cannot promise delivery with any certainty.

We quote, f. o. b. Chicago, as follows:

Blue annealed, No. 10, 2.10c; No. 12, 2.15c. Box annealed, No. 28, 2.50c. Galvanized No. 28, 3.60c.

For mill prices, see Pitsburgh report. Freight to Chicago, 18 cents.

Wire Products.—Independent producers are practically out of the market in this territory and in some instances are loaded up with low priced tonnage. Owing to a firm stand maintained in the past as to prices, the leading interest is in a position to fill its books with business at current quotations. Although the season is not advanced, fall trade is well under way.

We quote, f. o. b. Chicago, as follows:

Wire nails, jobbers' carload lots, $1.83; retailers' carload lots, $1.88, retailers' less than carload lots, $1.93; painted barb wire, jobbers' carload lots, $1.88; retailers' carload lots, $1.93; retailers less than carload lots, $1.98, with 30c for galvanizing; plain wire, jobbers' carload lots, $1.63; retailers' carload lots, $1.68.

Merchant Pipe and Tubes.—Western makers are falling a little farther behind on deliveries and are experiencing a demand that is without parallel at any previous time. The fall trade is well under way and there is no expectation of a decrease in demand until toward the end of October. Increased quotations may safely be expected in the near future.

We quote, store prices on merchant pipe and tubes, as follows:

Iron and Steel Pipe Basing Prices.

	Steel		Iron.	
	Black.	Galv.	Black.	Galv.
Butt.				
⅛ inch and ¼ inch.	69.2	48.2	62.2	41.2
⅜ inch	73.2	62.2	67.2	51.2
½ inch to 1¼ inch.	76.2	67.2	70.2	58.2
Lap.				
2 inch	74.2	66.2	67.2	57.2
4½ inch to 6 inch..	75.2	66.2	58.2	59.2
Card Weight.				
7 inch to 12 inch...	72.2	61.2	66.2	55.2
Extra Strong Plain Ends.				
Butt.				
⅛, ¼, ⅜ inch.....	64.2	52.2	59.2	47.2
½ inch	69.2	57.2	64.2	52.2
2 inch to 3 inch....	74.2	62.2	....	....
Lap.				
2 inch	70.2	58.2	65.2	53.2
7 inch to 8 inch....	64.2	52.2	59.2	47.2
Double Extra Strong.				
Butt.				
½ inch	57.2	45.2	....	....
¾ inch to 1½ inch.	60.2	49.2	....	....
Lap.				
2 inch	58.2	46.2	....	....
4½ inch to 6 inch..	59.2	47.2	....	....
7 inch to 8 inch....	52.2	40.2	....	....

Tubes.

	Lap weld steel.	Charcoal iron.	Shelby seamless.
	Per cent.	Per cent.	Per cent.
1 inch	37	..	55½
1¼ to 2¼ inch.....	53	38	34
2¾ to 3¼ inch.....	63	48	44
3½ to 4½ inch.....	65½	48	44
5 to 6 inch.....	53	..	..

Cast Iron Pipe.—Several inquiries for large tonnages have been sent out during the week and it is understood that others of the same caliber are pending. A number of western cities have authorized bond issues for waterworks construction and will be in the market shortly. Akron, O., is in the market for 12,000 tons of 36-inch water pipe and Kansas City is asking for bids on a lot of 2,500 tons. The city of Winnipeg will purchase 25,000 tons of 36-inch pipe and while makers on this side of the line are confronted by a heavy duty, it is thought that a considerable portion of the tonnage will come to this country owing to the inability of Canadian makers to handle it. Bids on the requirements of the city of Detroit for 6,000 tons, mentioned last week, were closed on Tuesday.

We quote, f. o. b. Chicago, as follows:

Four-inch water pipe, $28, 6 to 12 inches, $26.25, larger sizes, $25.50; gas pipe, $1 a ton higher.

Old Material.—The imminence of increased offerings by the railroads, together with the increases in consumers' stocks, has brought a reaction of the upward tendency in the market for old material. Embargoes have been placed on several items in numerous instances. As consumers have thus been able to secure scrap at bargain prices, stocks have increased somewhat. The tone of the market is decidedly easier and the consensus of opinion is toward further revision downward.

We quote, for delivery in consumers' yards, Chicago, as follows:

Gross Tons

Old car wheels	$13.25 to 13.75
Old iron rails	16.50 to 17.00
Rerolling rails (5 ft. and over)	13.25 to 13.75
Old steel rails (3 ft. and under)	12.50 to 13.00
Frogs, switches and guards	11.75 to 12.25
Heavy melting steel	11.50 to 12.00
Shoveling steel	11.50 to 12.00

Net Tons

No. 1 R. R. wrought	$12.00 to 12.50
No. 2 R. R. wrought	11.00 to 11.50
Arch bars and transoms	15.75 to 16.00
Knuckles, couplers and springs	11.75 to 12.25
Shafting	15.00 to 15.50
Iron car axles	19.50 to 20.00
Steel car axles	15.50 to 16.00
Locomotive tires	13.50 to 14.00
Dealers forge	9.75 to 10.25
Pipe and flues	9.00 to 9.25
No. 1 cast	11.75 to 12.25
No. 1 busheling	10.00 to 10.25
No. 2 busheling	7.25 to 7.75
No. 1 boiler cut	8.25 to 8.75
Boiler punchings	12.50 to 13.50
Cast and mixed borings	6.50 to 6.75
Machine shop turnings	7.25 to 7.50
Railroad malleable	11.75 to 12.25
Agricultural malleable	10.50 to 11.00
Angle bars, splices, etc., iron	14.25 to 14.75
Angle bars, steel	11.25 to 11.75
Stove plate and light cast scrap	10.00 to 10.50

CLEVELAND

Tremendous Pressure for Deliveries

Office of THE IRON TRADE REVIEW,
Penton Bldg., Aug. 13.

Iron Ore.—Indications are not lacking that there will be a very strong demand for vessel capacity for the movement of ore toward the close of the season and with a very heavy movement of grain expected, the outlook is that the lake season will end with a period of great activity. Vessel movements have been much hampered during the past few days by heavy fogs. Sales of odd lots of ore continue, but the tonnage purchased during the past week has not been heavy. Eastern furnaces are showing no interest in lake ores.

On base ores with the guarantee of 55 per cent on old range and Mesabi Bessemer, and 51½ per cent on old range and Mesabi non-Bessemer, we quote as follows: Old range Bessemer, $3.75; Mesabi Bessemer, $3.50; old range non-Bessemer, $3.00; Mesabi non-Bessemer, $2.85.

Pig Iron.—The market is extremely strong. The melt in the Cleveland district, especially by foundries making heavy castings, is showing a decided increase. One Cleveland furnace has made some additional sales at $14, furnace, for No. 2 foundry, for delivery during the remainder of this year. A Cleveland agency has sold about 6,000 tons of foundry iron for delivery during the first half of next year at $14.25, valley, for No. 2. It is probable that a considerable tonnage could be sold at that price without much effort, but furnaces are not anxious to dispose of their iron for delivery into next year. We quote, delivered in Cleveland, for the remainder of the year, as follows:

No. 1 foundry	$14.25 to $14.75
No. 2 foundry	13.75 to 14.25
No. 2 southern	15.85 to 16.35
Bessemer	15.15 to 15.33
Lake Superior Charcoal	16.25 to 16.50
Jackson co. 8 per cent silvery	18.05

Coke.—The principal interest in the market is in the very insistent demand of foundries for deliveries, showing that they are needing all the coke for which they have contracted. Quotations are being firmly adhered to. We quote as follows, at the ovens:

Connellsville furnace coke, $2.25 to $2.30 for prompt delivery, and $2.25 to $2.35 on contract; Connellsville foundry coke, $2.60 to $2.75 for prompt, and $2.50 to $2.75 on contract.

Finished Material.—Energies of sales agencies are being exerted almost entirely to hurrying deliveries and the agents state that the pressure for deliveries is greater than they have experienced in years. Buyers are so anxious to obtain material that they are often indifferent as to prices. Handsome premiums are being obtained by eastern mills, which have made some sales of plates as high as 1.69c, Cleveland, which represents a premium of $7.80 per ton above the usual quotation of 1.30c, Pittsburgh. Sheet prices are tending upward and some tonnage has been sold on the basis of 1.50c, Pittsburgh, for No. 10 blue annealed, while for last quarter delivery, 3.20c, Pittsburgh, has been paid for No. 28 galvanized. The shafting market is active and it is intimated that there will soon be a sharp advance in quotations. Structural shops are extremely busy and proprietors say that they have never had on hand and in prospect such a large number of projects. There is, however, a notable absence of large buildings proposed or under construction. The largest tonnage now under consideration is 3,750 tons for the Detroit-Superior Bridge Co., of which the trusses will be of nickel steel. The specifications include 500 tons of Bethlehem sections. Bids will be opened at noon, Aug. 24, and the bidders will be required to state the number of days required for completion after notification to proceed. As a number of months will be required to put in the foundations, it is not expected that delivery of steel will be called for prior to May 1, 1913. It would, in fact, be very difficult to obtain delivery this year without the payment of large premiums. Some engineers are severely criticising the decision of the county commissioners to require about 2,000 tons of nickel steel, as it is asserted that, as structural shapes cannot be given the heat treatment necessary for nickel steel, that material is not adapted for bridge building.

Old Material.—The scrap market is quiet. Reasons ascribed for the lull are the shutting down of one of the local rolling mills and the absence from the city of several of the buyers of steel-making scrap. Inquiries from outside territory for heavy melting steel continue in good volume, an inquiry from Sharon, Pa., having been received this week. The Empire rolling mill is closed for repairs. One of the local mills is buying No. 1 busheling quite actively. Heavy steel is difficult to obtain at current quotations, one dealer reporting that his bid of $13.75 on the Lake Shore list failed to secure the lot. Borings and turnings are in good demand, but local supply is going largely to Pittsburgh territory. Labor is scarce. The Norfolk & Western list closed August 15. We quote, f. o. b. Cleveland, as follows:

Gross Tons.

Old iron rails	$15.50 to 16.00
Old steel rails (under 6 ft.)	14.00 to 14.50
Old steel rails (over 6 ft.)	14.00 to 14.50
Relaying rails	19.50 to 20.00
Old car wheels	13.00 to 13.50
Old steel boiler plate	11.25 to 11.50
Malleable iron (railroad)	13.25 to 13.50
Steel axles	19.00 to 19.50
Axle turnings	10.50 to 11.00
Malleable iron (agricultural)	10.50 to 11.00
Heavy steel	12.75 to 13.25
Country mixed steel	11.25 to 11.75
Bundled sheet scrap	10.00 to 10.50

Net Tons.

No. 1 R. R. wrought	$12.50 to 13.00
No. 1 busheling	11.00 to 11.50
No. 1 machine cast	11.50 to 12.00
No. 1 dealers' wrought	11.00 to 11.50
Machine shop turnings	8.25 to 8.50
Pipes and flues	9.75 to 10.25
Wrought drillings	8.25 to 8.50
Stove plate	9.50 to 10.00
Cast borings	7.00 to 7.25
Wrought iron piling plate	14.50 to 15.00
Wrought iron arch bars	14.00 to 14.50

Chicago Steel Foundry Moves

The Chicago Steel Foundry Co. has moved into its new plant at the corner of Kedzie avenue and Thirty-seventh street, Chicago, and reports that the new equipment is in operation without any difficulties. The new plant has four times the capacity of the old and the move was made without the loss of a single day's operation. Fires were lighted Aug. 12 and castings were made the next day. The Chicago Steel Foundry is owned and operated by David Evans & Co.

The Mesaba Boiler & Mfg. Co., Duluth, Minn., has completed the installation of additional motive power and machinery, and is now running a double shift. The company deals largely in marine and mining work.

CINCINNATI

Round Tonnage Sold to a Detroit Melter

Office of THE IRON TRADE REVIEW,
503 Mercantile Library Bldg., Aug. 13.

Pig Iron.—There has been a little more activity in the market during the past week than for some time, and sales in most cases have adhered to the market quotations. Certain furnaces, also, have begun to take business for the first half of next year, but this movement has not been generally followed by the other interests, and the tonnage contracted for in this territory for delivery after December is comparatively small. A large Detroit melter has taken from 15,000 to 20,000 tons of iron, divided between northern and southern grades, for delivery to its various plants during the rest of this year and the first half of next year, a good proportion of which was sold by dealers in this city. A part of the southern iron to be shipped in 1913 is reported to have been made at $12.50, Birmingham. A large southern producer, although not in the market for deliveries after the last of this year, has also sold to an old customer for January delivery at $12.50, for No. 2 foundry, and a small lot of No. 1 at $12.75. An eastern Indiana melter has purchased 2,000 tons of northern and southern grades at prices reported slightly under quotations, for December, January and February delivery, and a large southern manufacturer recently bought 6,000 tons of Nos. 2 and 4 foundry iron. A Michigan user has taken 700 tons of Lake Superior charcoal iron for last quarter shipment, and an inquiry for 4,000 tons of malleable, 1,200 tons of No. 2 and 1,000 tons of No. 3, from the central part of the state for next year's delivery, will be closed within a day or so.

The southern situation is strong and prices range from $11.50 to $12, Birmingham, for No. 2 foundry for spot shipment, and $11.75 to $12 for the remainder of the year. A few of the furnaces are quoting $12.50, Birmingham, for 1913 delivery, but the majority are still refusing to take business for shipment after the last quarter. Most of the furnace grades are being held on the $12 basis, but recent bids and sales indicate that there are still a few furnaces offering iron at $11.50 and $11.75. The southern Ohio market also is strong, and on a more substantial footing than the southern. No. 2 foundry iron is being quoted in most cases at $14, Ironton, for this year's shipment, but a few furnaces have recently made scattered sales at $13.50 and $13.75 Ironton, for spot shipment, mostly on basic grades. A few furnaces are also offering iron for next year at $14.25 and $14.50, Ironton, but most of them are out of the market on any business beyond December. One of the largest interests in that district is out at present for any delivery on all except one make, and is refusing to bid on practically all inquiries submitted to it.

Stocks in furnace yards in Alabama decreased about 13,000 tons during July, as compared with a decrease of 8,000 tons during June of this year. At the beginning of the month there were approximately 110,000 tons in yards in that state, and on July 30, 97,000 tons, most of which is foundry iron.

Inquiries in the market at present include 2,000 tons of malleable iron from the central part of the state for last quarter shipment, 450 tons of low phosphorus iron from Detroit, also for last quarter delivery, and 300 tons of ferro manganese from St. Louis. With freight rates $3.25 from Birmingham, and $1.20 from Ironton, we quote Cincinnati prices as follows:

Southern foundry No. 2	$14.75 to 15.25
Southern foundry No. 3	14.25 to 14.50
Southern foundry No. 4	14.00 to 14.25
Southern gray forge	13.75 to 14.00
Mottled	13.00 to 13.75
Southern No. 1 soft	15.25 to 15.50
Southern No. 2 soft	14.75 to 15.25
Standard southern car wheel	25.50 to 25.75
Northern No. 2 foundry	14.95 to 15.20
Northern No. 3 foundry	14.45 to 14.70
Northern No. 4 foundry	14.20 to 14.45
Jackson co. 8 per cent silicon	17.20 to 17.45

Coke.—Two lots of furnace coke, each calling for the delivery of 5,000 tons a month for the rest of this year, have been sold in this territory within the past week at a price reported to have been $2.25, ovens. The market is more active than for some time, and dealers expect to see a considerable tonnage placed during the next few days. There are inquiries out for about 100,000 tons of furnace coke, a large part of which is from the Hanging Rock district and southern furnaces. Very little business is being done on foundry coke, the tonnages involved in most of the recent sales being small. Connellsville furnace coke is being held at from $2.25 to $2.50, ovens, this range of price covering both spot and contract shipment. Connellsville foundry coke is quoted at from $2.50 to $2.75. Wise county brands can be had at from $1.85 to $2.25, and one large interest, which is practically sold up, is holding for nothing lower than $2.25 to $2.50. Pocahontas and New River grades have not changed to any extent in regard to prices. We quote below from the leading coke producing districts as follows:

	Prompt shipment.	Contract.
Connellsville district:		
Foundry coke	$2.50 to 2.75	$2.50 to 2.75
Furnace coke	2.25 to 2.35	2.25 to 2.50
Wise county district:		
Foundry coke	$2.50 to 2.75	$2.50 to 2.75
Furnace coke	1.85 to 2.25	*Sliding scale basis.
Pocahontas district:		
Foundry coke		$2.25 to 2.50
Furnace coke	1.85 to 2.25	2.00 to 2.50
New river:		
Foundry coke	$2.50 to 3.00	$3.00 to 3.25
Furnace coke	2.15 to 2.25	2.25 to 2.50

*Sliding scale basis means $1.60 for coke based on $9, Birmingham, for pig iron, with an advance of 16 2-3 per cent of the amount over $9 which pig iron is quoted. This is the usual basis. Other forms of sliding contracts are also made.

Finished Material.—An attractive tonnage of 3,000 tons of steel bars and structurals in this market was recently turned down by a number of representatives of large eastern manufacturers who state that they are out of the market on practically all finished articles. The present prices of 1.30c for steel bars and 1.35c for structurals, Pittsburgh basis, are expected to be advanced 5 cents per 100 pounds the latter part of this week or the first of next week. The local sheet situation is very strong, and the local mill has enough business on its books to extend over the next 60 or 90 days. Prices are firm and an advance of $2 a ton on galvanized and black sheets is looked for within the next few days. Black sheets are quoted at 2.05c for No. 28 gage, and galvanized sheets No. 28 at 3.15c, both Pittsburgh basis. For other mill prices, see Pittsburgh report.

Plans are being prepared for a new hotel to cost from $1,000,000 to $1,-

500,000, which will be erected on the site of the old St. Nicholas hotel, this city, at Fourth and Race streets. A large eastern banking house has agreed to finance the new proposed union station here, but on a smaller scale than was originally planned. Those promoting the project expect to have new plans drawn and excavations started by next December.

Warehouse business is good and prices are gradually growing stronger with the probability that they will be advanced before the end of the week. Stocks in warehouses continue to diminish at a faster rate than they can be replenished, and some of the dealers are entirely out of supply on a large number of articles. Concrete reinforcing bars and other building supplies are the best in demand. We quote below warehouse prices, f. o. b. Cincinnati, as follows:

Steel bars, 1.75c base; iron bars, 1.70c base; structurals, 1.95c base; plates, ¼ inch and over, 1.85c base; sheets, blue annealed No. 10, 2.05c base; rivets, cone head, 2.30c base; cold rolled shafting, 60 per cent discount; boiler tubes as follows: 1¾ to 2¼ inch, 60 per cent discount; 2½ inch, 62 per cent discount; 2¾ to 3¼ inch, 65 per cent discount; 3½ to 4½ inch, 67 per cent discount; and 5 to 6 inch, 60 per cent discount; cold rolled shafting, 60 per cent discount; soft steel cold twisted concrete bars, cut to length as follows: ¾ inch square and larger, 1.90c; ⅝ inch square and larger, 2.00c; ½ inch square and larger, 2.10c; 5-16 to ⅜ inch square and larger, 2.30c; ¼ inch square and larger, 2.45c.

Old Material.—There is a little better demand for scrap iron, but the market is still inactive, and prices are stationary. Local foundries are beginning to buy again, but only occasionally, and generally in small lots. This, however, indicates a probable improvement in the near future after a long dull period during the summer months, and a recent demand that has come from Pittsburgh territory should also have a good effect upon the market. A small tonnage of No. 1 busheling was recently sold at $8, and a firm outside of the city bought some machine shop turnings at $6.50. We quote below prices dealers will pay and also dealers' selling prices in Cincinnati and vicinity, as follows:

Gross Tons

Old iron rails	$12.25 to 13.00
Old steel rerolling	10.75 to 11.25
Old iron axles	17.25 to 17.75
Heavy melting scrap	9.75 to 10.25
Relaying rails	19.75 to 20.75
Bundled sheet scrap	7.50 to 8.00

Net Tons.

Old No. 1 R. R. wrought	$10.00 to 10.50
No. 1 machinery cast	10.00 to 10.50
No. 1 busheling	7.75 to 8.50
Stove plate	7.50 to 8.00
Machine shop turnings	6.25 to 6.75
Cast borings	6.00 to 6.50
Heavy turnings	6.75 to 7.25
Mixed cast	8.50 to 9.00
Malleable	7.00 to 7.50

PHILADELPHIA

Early Inquiry for First Quarter Basic

Office of THE IRON TRADE REVIEW,
Philadelphia, Aug. 13.

The strength of finished conditions in other districts and the generally delayed state of deliveries continues to be reflected in the generous premiums being paid eastern mills for quick deliveries of material. In plates and shapes further cases of $6 to $8 being paid by consumers over the official market on small quantities are noted. Premiums in sheets have also developed notwithstanding the fact that the leading eastern maker has advanced its schedule $1. New business is still coming in freely and specifications are heavy. Declining iron stocks in eastern Pennsylvania and Virginia are supporting the accumulating strength of the market. The inquiry of a large eastern buyer for a heavy block of first quarter basic is significant of the willingness of leading consumers to cover forward at a very early date. Scrap is more active and shows strength.

Pig Iron.—Fundamental conditions of strength in the eastern and Virginia pig iron producing districts are gradually being added to by the shrinkage of stocks and by more liberal order bookings. Accumulation of merchant iron on furnace banks in eastern Pennsylvania and in Virginia declined about 10,000 tons in each district during July. In Virginia, total stocks are practically down to the large block of metal that has been carried there for the past five years by the leading producer of the territory. Booked orders with Virginia makers also increased considerably during July. Orders with eastern Pennsylvania makers declined somewhat in July, according to reports of the Eastern Pig Iron Association, but this condition is significant of more conservative selling forward on the part of makers rather than any decrease in trade. The market in eastern Pennsylvania in fact continues to manifest strength and is moderately active. The one branch that is yet to show liberal buying is foundry iron, which the gray iron shops at present are not ordering very liberally. There are signs of increased melt among the consumers, however, and a more sizable buying movement is expected soon. Eastern Pennsylvania No. 2X prices are very firm over the range of $15 to $15.50, furnace. The improved conditions in Virginia are reflected by the official advance of 25 cents posted this week by the Virginia Iron, Coal & Coke Co. for last quarter to $13.75, furnace, for No. 2X, $13.50 for No. 2 plain and $13.75 for No. 3 and lower grades. Two or three other Virginia makers are now quoting No. 2X at $14, furnace. An interesting development in the steel-making situation is the appearance in the market for its first quarter requirements of basic by the largest eastern consumer of this grade. Its requirements over a quarter usually reach from 40,000 to 45,000 tons. Eastern makers of basic are somewhat reluctant to commit themselves so far ahead and some of them have expressed themselves as not willing to quote below $16.50, delivered, for this shipment. This same buyer in the week took 3,000 tons of basic additional for fourth quarter at $15.75, delivered. A Virginia pipe shop which was out for 6,000 tons of No. 3 and forge for last quarter increased the amount to 7,500 tons on final action, awarding 6,000 tons to one Virginia maker and 1,500 tons to another at a price of $13, furnace. A Delaware river pipe shop continues in the market for 5,000 to 10,000 tons additional of low grade iron.

We quote for prompt and last quarter shipment to consumers' plants

in Philadelphia and vicinity as follows:

Eastern Pa. No. 1X foundry	$16.25 to 16.50
Eastern Pa. No. 2X foundry	$15.75 to 16.00
Eastern Pa. No. 2 plain	15.50 to 15.75
Standard gray forge	15.25 to 15.50
Basic Eastern and Central Pa.	15.75 to 16.00
Virginia No. 2X	16.55 to 16.75
Southern No. 2	15.75 to 16.50
Standard low phosphorus	20.50 to 21.00
Malleable	15.25 to 16.50

Coke.—Two eastern furnacemen have closed last half contracts for Connellsville coke at $2.25, ovens, one of these orders calling for 6,000 tons monthly. In one case, the purchase was forced by the failure of an eastern broker who had gone short on the market, to make deliveries on a contract taken at $2.10, ovens. A similar condition prevails on a contract with another eastern consumer for 8,500 tons monthly taken at $1.70, ovens. There are rumors that court proceedings may be instituted by these buyers, but there have been no developments as yet of this character. One lot of Connellsville coke for delivery through part of September is reported at $2.10, ovens. An eastern furnace about to resume has purchased 15,000 tons of West Virginia coke at $2, ovens. Representatives of the Producers' Coke Association called upon eastern furnacemen the past week to explain their position in connection with the recent unsuccessful movement among sellers to force the contract market to $2.50, ovens.

Finished Material.—Premiums paid to eastern mills for early deliveries on plates, structural shapes, sheets and semi-finished steel continue of quite common occurrence. In plates, some fair-sized orders were placed with eastern makers this week for buyers west of Pittsburgh at prices which net the seller 1.50c, mill, equivalent to about $6 above the Pittsburgh base. Universal plates predominated in this business. Eastern shape mills have been able to get 1.60c at the mill on small lots from stock or for quick delivery, and up to 1.70c to 1.75c, Philadelphia, or $6 to $8 above the official Pittsburgh base. The leading eastern sheet maker has advanced $1 above the regular market to 1.50c, Pittsburgh, or 1.65c, Philadelphia, and is entering some prompt orders at $1 to $2 over this higher level. A recent order for 4,000 tons of sheet bars to a central Pennsylvania buyer was done at a price not less than $24, Pittsburgh, to the purchaser.

Activity in new business is still quite pronounced. Makers of billets and of sheets report an especially vigorous inquiry in these lines during the past week, but the mills are going more slowly in quoting as far ahead as buyers have specified. In plates, eastern makers are still booking from week to week at a rate equal to full capacity operations and they are not having thereon delivery schedule, which is about four weeks on sheared and eight weeks on universal. On last quarter contracts advances of $1 and $2 a ton are asked. There is considerable demand for 20 and 24-inch structural beams and premiums are frequently paid. Bar iron is gaining strength and a minimum of 1.35c, Philadelphia, is asked by some mills. Specifications against contracts generally are very heavy.

New structural projects are apparently being held back by the deferred deliveries on steel. The American Bridge Co. has taken 700 tons for extensions of the plant of the Armstrong Cork Co., in Camden. Barber & Ross have about 300 tons for an addition to Reugers hotel, Richmond.

The inquiry for 50,000 tons or any part of this tonnage of plates, put before eastern mills by Brown & Co., shipbuilders of Glasgow, Scotland, has not developed anything definite for those makers, some of whom bid on the business up to 10,000 tons. The order is believed to have gone to British mills, which is in line with the expectations of leading export authorities who did not take very seriously the opportunity of bidding for the specified tonnage. Another inquiry for 5,000 tons of plates, also for Scotland, remains pending, but eastern makers are less inclined to name prices necessary to meet the home competition.

We quote, delivered at consumers' plants in Philadelphia and vicinity, as follows:

Plain structural shapes, 1.50c to 1.60c; tank plates, 1.50c to 1.60c; steel bars, 1.45c; common bar iron, 1.32½c to 1.35c; cut nails, 1.80c to 1.85c; blue annealed sheets, No. 10 gage, 1.65c to 1.70c; 4 x 4-inch open-hearth rolling billets, $24.40; forging billets, $29.40 to $30.40. Extras shown under Pitsburgh report. Philadelphia warehouse prices 1.85c for plates, shapes and bars.

Old Material.—A freer buying movement is manifested in the market, especially in heavy steel, of which two or three eastern mills have been purchasers of fair tonnages at $14, delivered. One steel maker took about 5,000 tons at this figure and another several thousand tons. Dealers have not been willing to accept orders at $14, delivered, as freely as the mills have desired, and have usually limited individual orders to about 1,000 tons. The heavy steel in the railroad lists just closed went at over $14, delivered, and is understood to have gone to consumers direct. Several steel works are still threatened with embargoes because of the accumulation of scrap. There has been some buying of car wheels, about 500 to 1,000 tons at $14.50, delivered. The undertone of the market generally continues strong. Sales of rerolling rails to central Pennsylvania mills have been made at $15.50, delivered.

We quote, gross tons, delivered at consumers' plants in eastern Pennsylvania and western New Jersey, as follows:

Old iron rails	$16.50 to 17.00
Old steel rails (rerolling)	15.25 to 15.50
No. 1 heavy melting steel	14.00 to 14.25
Old car wheels	14.25 to 14.50
Old iron axles	24.00 to 25.00
Old steel axles	17.50 to 18.00
No. 1 railroad wrought	15.75 to 16.00
Wrought pipe	12.50 to 13.00
Cast borings	9.75 to 10.25
Machine shop turnings	10.75 to 11.25
Heavy cast	13.50 to 14.00
Malleable	11.75 to 12.25
Stove plate	10.75 to 11.25
No. 1 forge	12.50 to 12.75

Freight rates per ton on scrap from Philadelphia to principal eastern consuming points are: $0.60 to Ivy Rock, Pa.; $0.65 to Phoenixville, Pa.; $0.80 to Coatesville, Pa.; $0.85 to Bethlehem, Pa., Reading, Pa., and Roebling, N. J.; $1.10 to Pottsville, Pa., Lebanon, Pa., and Columbia, Pa.; $1.20 to Harrisburg and Steelton, Pa.; $1.40 to Milton, Pa.

HUGE STRUCTURE

Will Occupy Old Equitable Site—To Be Largest In World.

Announcement is made that a syndicate headed by T. Coleman Dupont of Wilmington, Del., has acquired the site of the old Equitable Life Assurance Society building, on lower Broadway, New York, and will erect thereon a 36-story office building which, because of the extensive ground area of the property, will contain the largest space of any office building in the world. The site covers a whole block, having a frontage of 167.11 feet on Broadway, 150.3 feet on Nassau street, 310.1 feet on Cedar street and 305.5 feet on Pine street. The consideration in the transaction was about $14,000,000, and the purchase represents the largest single deal in real estate ever consummated in the metropolis and probably in the world. The site has remained vacant since the destruction by fire of the old Equitable building on Jan. 9, last. The new building is to be ready for occupancy by May 1, 1914. The steel requirements will be the largest of any single office structure in the world and will aggregate 30,000 to 35,000 tons. L. J. Horowitz, president of the Thompson-Starrett Co., is one of those interested in the enterprise and that company will do the general contracting work.

NEW YORK

Liberal Pig Iron Buying—Big Structural Prospects

Office of THE IRON TRADE REVIEW,
1115 West Street Bldg., Aug. 13.

Iron Ore.—Recent mining developments in Cuba have produced a new and very pure low phosphorus ore and this is now being offered to eastern merchant furnaces. The El Cuero mine of the Ponupo Manganese Co. has just sold 6,000 tons of this ore to an eastern Pennsylvania furnace, at 9 cents per unit, f. o. b. cars, Philadelphia. The ocean freight market continues very strong and steamers are hard to obtain. A charter of the steamer Dunholme from Batoum or Poti, Asia Minor, to Philadelphia or Baltimore, for 4,800 tons of manganese ore, has been done at 16s 6d, which illustrates the high level prevailing from that zone.

Pig Iron. — Buying of iron on a very liberal scale has continued during the past week in the metropolis, New York state and New England territory and on practically all the tonnage placed, makers have had no difficulty to obtain the price advances asked. Not an inconsiderable part of this tonnage has been for first quarter delivery and most of the business for that period has gone to Buffalo makers, as eastern and central Pennsylvania and Virginia producers are not yet disposed to freely quote after Jan. 1. Buffalo iron for first quarter is now held at $14.50, furnace, for No. 2X and is firm at this price, though below this level has been done in some cases. For this year, the Buffalo market ranges from $14.25 to $15, furnace, for No. 2X. The principal buying in this market has been done by one large equipment builder, which closed for 20,000 to 25,000 tons of foundry grades for delivery running through the first quarter to a number of different plants. This business was divided among several makers. A New Jersey stove maker who has been out for 2,500 to 5,000 tons of No. 2X for first quarter has closed against this inquiry; a New Britain, Conn., buyer has taken about 3,000 tons of No. 2X for deliveries over the first quarter; an up-state buyer has taken 3,000 tons of special analysis iron for first quarter and another Connecticut consumer 1,000 tons of No. 2X for first quarter.

Other sales include about 1,000 tons of high phosphorus iron to the General Electric Co. for Schenectady delivery and 2,000 tons of No. 1 and No. 2X to the New York Central Railroad, for shipment this year to Frankford, N. Y. New England consumers have been buying liberally of Virginia iron for shipment this year and some tonnage has been sold at $13.75, furnace, for No. 2X, the advanced price now quoted by the leading maker of that district. This maker is now adhering to the differential over No. 2X iron and is quoting $14, furnace, for No. 1 grade. Inquiries are fairly generous. A New Jersey buyer is out for 500 tons to 1,000 tons of No. 2 plain and another for 600 of No. 2X, both for this year. An upstate railway equipment maker is out for several thousand tons of malleable. Foundry iron prices continue to firm up and the minimum for No. 2X at tidewater is now close to $16, delivered. In eastern Pennsylvania, a $15 furnace price, even for early shipment is becoming rare. Central Pennsylvania makers advanced 25 cents in the week and are now quoting at from $14.25 to $14.50, furnace, for No. 2X. A New Jersey buyer of basic has closed for 1,000 tons of this grade from eastern Pennsylvania, for shipment this year at $15.90, delivered. Sales of from 2,000 to 3,000 tons of charcoal iron are also noted. We quote for prompt and last quarter shipment at tidewater, as follows:

Northern foundry No. 1	$16.25 to 16.50
No. 2X foundry	15.90 to 16.25
No. 2 plain	15.50 to 15.90
No. 2 Virginia	16.55 to 16.75
No. 2 southern foundry	16.00 to 16.50
Malleable	16.00 to 16.25
Gray forge	15.25 to 15.50

Ferro-Alloys. — An increased consumption which evidently exceeds estimated requirements when earlier purchasing was done, is forcing some large buyers of ferro-manganese into the market for quick shipment material. Spot ferro, however, is scarce and the tonnage offered for this year is limited and these buyers are having difficulty to satisfy their demands. The prompt market is not clearly defined, but substantial advances over the $51, seaboard, forward price, can readily be obtained. An interesting side-light of the situation is the effort of sellers to buy of one another. A Pittsburgh steel maker has taken about 1,000 tons for early shipment and a lake mill is out for 1,000 tons. There is not much forward buying. Fifty per cent ferro-silicon is very strong at quoted prices. We quote, 80 per cent standard English ferro-manganese for forward shipment at $51, seaboard, and 50 per cent ferro-silicon at from $70 to $72.50, Pittsburgh.

Cast Iron Pipe.—Public lettings in the east are now coming out a little more freely. Lowell, Mass., took bids today on 700 tons, Medford, Mass., will take bids tomorrow on 150 tons and bids will go in Thursday for 400 tons for Taunton, Mass. Philadelphia is reported to have recently placed 1,700 tons of assorted sizes. Reports indicate that New York City will shortly offer its large requirements for 36-inch pipe, amounting to 25,000 tons or more, for the Catskill aqueduct, which has been in view for the year past. There continues a liberal buying of small pipe. Prices, while improving, are still subject to some irregularity. We quote 6-inch pipe at from $22 to $23, delivered New York, in carload lots.

Finished Material.—Unusually large tonnages for individual structural projects are marking the finished steel situation in this district at the present time. Bids are going in this week on the heavy requirements for elevated and subway extensions of the Brooklyn Rapid Transit Co., which call for 91,000 tons of structural material for shipment over four years, with an option on 60,000 tons additional for delivery in one year. Of the 91,000 tons asked, 50,000 tons is made up of plates and 41,000 tons of shapes and bars; of the 60,000 tons additional, the division is 40,000 tons of shapes and bars and 20,000 tons of plates. It is not likely that an award of this tonnage will be immediately announced, as the buyer has yet to finally close operating contracts with the city.

Announcement made this week of the purchase by a syndicate of the Equitable site on lower Broadway

for the erection of a 36-story office building, presents a heavy steel requirement, which, it is estimated, will run from 30,000 to 35,000 tons. Owing to the extensive ground space, the tonnage will be about the heaviest for any single building in the metropolis. The Thompson-Starrett Construction Co. will do the general contracting work and it is expected that the steel will probably go to the leading interest. The steel, about 10,000 tons, for the new Western Union Telegraph skyscraper, plans for which were filed in the week, is also conceded to the American Bridge Co., which is, at present, furnishing the material for the first portion of this work, now under construction.

Fancy prices continue to be paid for finished materials where quick shipments are available. Structural shapes have been sold in the east for shipments into western markets at fully $6 premium aver 1.35c, Pittsburgh price, and one eastern maker has been quoting and selling some steel bars at 1.60c, Pittsburgh. Eastern plates are likewise commanding liberal premiums, in some cases.

Apart from the very large projects pending, the structural market is not putting forth a very heavy tonnage of miscellaneous work. The American Bridge Co. has about 200 tons for a bridge for the Central Railroad of New Jersey, at Newark. The bridge over the Mystic river, Boston, has not yet been placed. Ravitch Brothers have 600 tons for the Cruishank warehouse on West Twenty-seventh street. Bids are still being taken on about 700 tons for the office building of W. R. Grace & Co., on Old Slip, Water and Pearl streets, and also on 1,200 to 1,500 tons on two apartments for the Dungan Construction Co., at Wadsworth avenue and 172nd street. Plans will soon be out for a 12-story office building at 58-62 New street, to require about 1,200 tons. We quote, delivered New York tidewater, as follows:

Plain structural shapes, 1.51c to 1.56c; tank plates, 1.51c to 1.56c; steel bars, 1.46c; common iron bars, 1.35c to 1.40c; steel bars from store, New York delivery, 1.90c; plates and shapes from store, 2.05c; extras as shown under Pittsburgh report.

Rails and Track Material.—The railroads continue to manifest interest in rails for delivery after the first of the year. The Great Northern is now out for 15,000 to 20,000 for that period. Bids go in this week for practically 21,000 tons of running and contact rails with an option asked on 15,000 tons additional for the Brooklyn Rapid Transit Co. The Manhattan and Jamaica railroad is out for 2,000 tons of girder rails. The St. Louis & San Francisco railroad is credited with having purchased 6,000 tons and the Atlanta, Birmingham & Atlantic, 5,000 tons.

Old Material.—Improvement in conditions among the iron mills is manifested in the increased buying of old material by these consumers. At the present time, there is quite a fair movement of wrought scrap to eastern rolling mills at better prices. For No. 1 railroad wrought, $16, delivered, is being paid. A recent sale of 1,000 tons of wrought pipe is noted. Eastern Pennsylvania steel mills are still taking some tonnage from dealers in a moderate way, but the latter are usually asking in advance of what these consumers will pay, in some cases, up to $14.50, delivered. The present market is $14, delivered. Railroad malleable in the east has sold at $13.75, delivered. There has been some clearing this week of the heavy accumulations of scrap upon track at the plants of several eastern steel works, which last week threatened the declaration of embargoes. We quote, gross tons, prices New York dealers will pay at tidewater, as follows:

Old car wheels	$11.75 to 12.00
Old iron axles	20.00 to 21.00
Steel axles	15.25 to 15.75
Old steel shafting	14.50 to 15.00
No. 1 heavy melting steel	11.50 to 11.75
No. 1 R. R. wrought	13.50 to 14.00
Wrought pipe	10.00 to 10.25
Cast borings	7.25 to 7.50
Machine shop turnings	8.25 to 8.50
Heavy cast	10.75 to 11.00
R. R. malleable	10.75 to 11.00
Stove plate	8.25 to 8.75
Grate bars	7.50 to 8.00

Freight rates on scrap per ton to Steelton, Pa., Columbia, Pa., Pottsville, Pa., and Harrisburg, Pa., are $1.50 from Jersey City, and $2.00 from New York; to Coatesville, Pa., Ivy Rock, Pa., Phoenixville, Pa., and Reading, Pa., $1.50 from Jersey City, and $1.80 from New York; to Bethlehem, Pa., $1.10 from Jersey City, and $1.60 from New York; to Roebling, N. J., $1.00 from Jersey City, and $1.50 from New York; to Milton, Pa., $1.60 from Jersey City, and $2.00 from New York; to Jersey City, $1.00 from New York; to Newark, $1.10 from New York.

BIRMINGHAM

Stocks Reduced and Prices Firm

Office of THE IRON TRADE REVIEW,
Birmingham, Ala., Aug. 12.

Pig Iron.—The volume of business transacted in this market in the past ten days is very liberal, and all signs point to stronger underlying conditions. In all cases a basis of $12 at Birmingham is being adhered to for deliveries in the remainder of the year, while in recent transactions involving round tonnages, a differential of only 25 cents per ton on the No. 2 foundry price was made for the low grades. A significant feature of the market at this time is the inquiry that is being made for deliveries after Jan. 1 next. Within the week, some 10,000 tons, in lots of 2,500 to 3,000 tons each, were submitted for the first quarter, but without eliciting quotations. The aggregate of sales made since last report through local offices is estimated at 12,000 to 15,000 tons. In addition to this, a round tonnage of re-sale iron is reported sold through a northern office at the ruling schedule of prices. A lot of 100 tons of gray forge was sold locally during the week at $11.25 per ton at furnace.

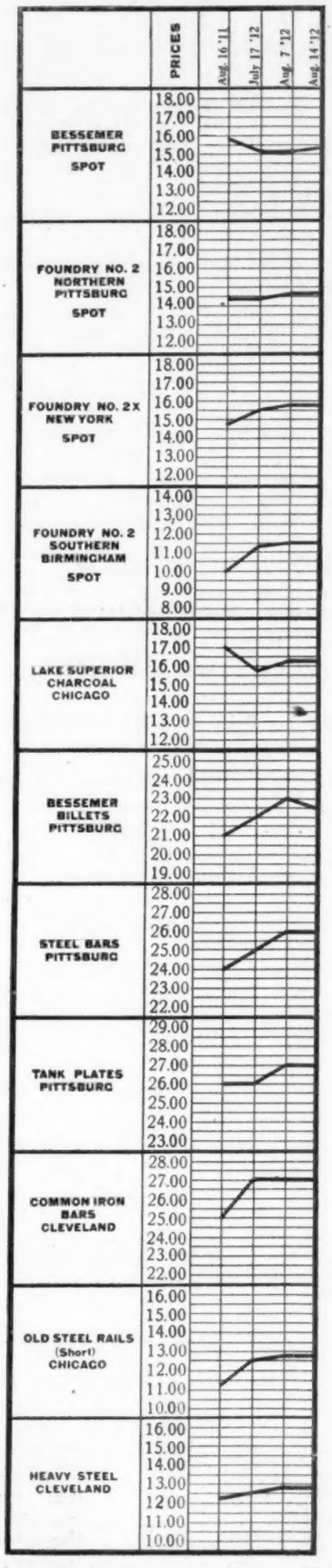
Stock figures as of Aug. 1 show an approximate accumulation in this state of 60,000 tons of free foundry; 33,500 tons of warrants, and 9,000 tons of basic. This is a decrease of about 8,000 tons during July. In the free foundry iron accumulation, 6,000 tons are shown that are not being offered for sale, leaving the available tonnage of all grades but slightly over 100,000 tons. The active producing capacity on Aug. 1 was represented by 13 stacks on foundry; six stacks on basic, and two stacks on charcoal iron. This rate of production has not been changed since the first of the month, but one additional stack will probably be blown in about Sept. 1. As to whether or not the increase proposed will be offset by the blowing out of one furnace now in blast, developments at the plant in question will govern. With all parties concerned apparently content with conditions existing, the market is quoted firmly as below for deliveries in the remainder of the year, with a decided tendency to advance to a higher basis when order-books are opened for deliveries further advanced. The schedule of prices is as follows, per gross ton, f. o. b. cars at Birmingham district furnaces, viz.:

For delivery during the remainder of the year:

No. 1	foundry	$12.50
No. 2	foundry	$11.50 to 12.00
No. 3	foundry	11.00 to 11.50
No. 4	foundry	10.50 to 11.00
Gray forge		10.25 to 10.75
Mottled		10.00 to 10.25
Standard basic		10.75 to 11.25
Off basic		10.50 to 10.75
Standard charcoal		22.50 to 23.00

With the exception of charcoal iron, an advance of 25c to 50c per ton would be asked

PRICE CHART



over the above figures for deliveries in the last quarter.

Cast Iron Pipe.—Recent reports in this market concern prospective business rather than contracts actually placed. The volume of business now on order-books is very satisfactory when compared with the rate of production, but recent bookings have consisted largely of requirements for maintenance work. With the higher prices for raw material, all pipe producers' asking prices are firmer, and it is hardly likely that the schedule below would be shaded even for large municipal requirements. Shipments against all contracts were very heavy in the past month, and no accumulation of stock was in evidence on producers' yards on Aug. 1. Water pipe is quotable as follows, per net ton, f. o. b. cars here: 4-inch, $23.50; 6-inch, and up, $21.50, with $1 per ton extra for gas pipe. Special fittings are quoted in line with the above, which means from $45 to $50 per net ton at foundry.

Old Material.—Cast material continues strongest in demand, while no improvement has been noted in the movement of wrought and steel grades. The transactions recently reported consist of carload quantities, which applies both to consumers' requirements and to sales made to dealers. Dealers' holdings are quotable at about the following schedule, per gross ton, f. o. b. cars here.

Old iron axles (light)	$15.50 to 16.00
Old steel axles (light)	12.00 to 12.50
Old iron rails	12.00 to 12.50
No. 1 R. R. wrought	12.00 to 12.50
No. 2 R. R. wrought	10.50 to 11.00
No. 1 country	8.50 to 9.00
No. 2 country	6.50 to 7.00
No. 1 machinery	9.00 to 9.50
No. 1 steel	9.50 to 10.00
Tram car wheels	8.50 to 9.00
Standard car wheels	10.50 to 11.00
Light cast and stove plate	7.00 to 7.50

ST. LOUIS

Good Pig Iron Inquiry is Now Out

Office of THE IRON TRADE REVIEW,
St. Louis, Aug. 12.

Pig Iron. — One of the largest plants in the St. Louis territory is in the market for 10,000 tons of malleable iron, and there is a tentative inquiry out, based on the placing of a certain contract with the inquirer, for 5,000 tons of analysis iron that would include both northern and southern grades. Another inquiry is out for 500 tons of ferro-manganese for an Iowa plant, and another one for 300 tons of ferro-manganese for St. Louis. Prices on southern iron, delivered, to which the Birmingham freight of $3.75 has been added, follow, the higher price more nearly representing the market:

Southern No. 1	$16.00 to 16.25
Southern No. 2	15.50 to 15.75
Southern No. 3	15.00 to 15.25
Southern No. 4	14.75 to 15.00

Coke. — Fear of a car shortage within the next 60 days has had a tendency to strengthen the market, and while there is no big inquiry out, scattered inquiry would amount to a considerable tonnage. The St. Louis Manufacturers' and Importers' Association of St. Louis has sent out 5,000 circular letters urging shippers and manufacturers to aid the railroads as much as possible in promptly loading and unloading freight cars. Coke quotations remain as follows:

We quote 72-hour Connellsville foundry grades, $2.50 to $2.75 for immediate shipment or delivery through the year; 48-hour Connellsville furnace, $2.25 to $2.40; best 72-hour Virginia foundry, $2.50 to $2.75; 48-hour Virginia furnace, $2.25 to $2.40. The freight to East St. Louis and St. Louis is $2.80, and $2.70 from the Virginia fields when shipment is destined beyond St. Louis.

Old Material.—The Southern Railroad is out with a list for 1,000 tons of scrap, and the Vandalia with one for 300 tons, upon which bids will be closed this week. The market is quite strong for scrap. The steel and rolling mills are ready to buy, and conditions are generally good. Prices which dealers are willing to pay f. o. b., St. Louis, follow:

Gross Tons.

Old car wheels	$14.50 to 15.00
Old iron rails	15.25 to 15.50
Re-rolling rails (5 ft. and over)	12.50 to 13.00
Old steel rails (3 ft. and under)	11.50 to 12.00
Light section relayers (45 lb. and under) subject to inspec.	21.50 to 22.50
Relaying rails, subject to inspec.	23.00 to 23.50
Frogs, switches and guards	9.50 to 10.25
Heavy melting steel	11.00 to 11.50
Shoveling steel	9.75 to 10.25

Net Tons.

No. 1 railroad wrought	$11.50 to 12.00
No. 2 railroad wrought	10.50 to 11.00
Arch bars and transoms	13.25 to 13.50
Knuckles, couplers and springs	9.50 to 10.00
Shafting	13.00 to 13.50
Iron car axles	18.50 to 19.00
Steel car axles	16.50 to 17.00
Locomotive tires	10.50 to 11.00
No. 1 country wrought	9.00 to 9.50
Pipe and flues	8.00 to 8.50
Tank iron and cut boilers	8.00 to 8.50
No. 1 cut busheling	9.50 to 10.00
No. 2 cut busheling	8.50 to 9.00
Cast and mixed borings	6.75 to 7.25
Machine shop turnings	7.50 to 8.00
Railroad malleable	10.00 to 10.50
Agricultural, malleable	9.00 to 9.50
Stove plates	8.50 to 9.00
Angle splice bars (iron)	10.75 to 11.50
Angle splice bars (steel)	9.00 to 9.50

BUFFALO

Heavy Pig Iron Buying—Prices Advanced

Office of THE IRON TRADE REVIEW,
Buffalo, Aug. 13.

Pig Iron.—The statement of a week ago that the market seems established on a sounder basis than in the past five years was sustained by last week's placement and inquiries. Orders were placed for fully 100,000 tons with the furnaces in the district, and the tonnage under negotiation is close to this figure in volume. This constituted the heaviest transactions for any single week within the past five years, and the indication of continued good business is manifest on every hand. The increasing demand for iron of all grades and the continued heavy specifying, taxing the full capacity of the local furnaces, has caused the selling interests to advance their schedules as indicated below.

We quote the following range of prices, f. o. b., as a basis of the transactions in this district:

No. 1X foundry	$14.50 to 15.00
No. 2X foundry	14.25 to 14.75
No. 2 plain	14.25
No. 3 foundry	14.00 to 14.25
Gray forge	14.00
Malleable	14.50 to 15.00
Basic	14.50 to 15.25
Charcoal	16.00 to 17.50

Finished Material.—Every mill doing business here is from weeks to months behind on deliveries of bars, shapes, plates, hoops, structural and other products under contract and demand is in increasing volume by the fabricators and users in this territory. Although orders from warehouse stock were welcomed in ton lots, a few months ago, it is now a matter of frequent occurrence for carload lots to be purchased from warehouses at an advance of over $8 per ton over mill prices. New business instead of being sought is being scrutinized and the market, which has become purely a sellers' one, has caused the mill to assume the attitude of accepting only favorable contracts. Warehouse prices advanced $1 on Monday.

METAL MARKETS

Copper Firm—Foreign Demand Dull

New York

Aug. 13.

Copper.—Electrolytic copper, 30 day delivery, is now held firmly at 17.75c and, although the market remains quiet, a good October business is being done at this figure. The foreign demand for October copper is still dull but leading producers expect early action from this source. Lake copper is held firm at 17.75c, and casting at 17.62½c. Today's London closing price is £78 12s 6d for both spot and three months, compared with £78 10s and £78 15s, respectively, a week ago. Copper exports since Aug. 1 are 7,788 tons.

Tin.—The market, although stronger than last week, is dull as consumers are buying very carefully. Some spot was sold yesterday at 45.75c, but very little future buying is being done. Today's close on the London exchange was £207 for spot and £205 for three months, compared with £204 10s and £202 5s, respectively, a week ago. The close in New York today was 45.75c, compared with 45.25c a week ago. Arrivals of tin since Aug. 1 are 2,213 tons, while 1,640 tons are afloat.

Antimony.—Cookson's is held at 8.50c to 8.75c, Hallett's at 7.87½c, and Hungarian at 7.62½c to 7.75c.

Chicago

Aug. 12.

New Metals.—While there appears to be a good demand for new metals, copper is perceptibly weaker and there is a downward tendency on some other items. It is thought, however, that general business conditions coupled with the exceedingly strong position of iron and steel producers will prevent any sustained weakness.

We quote, dealers' selling prices, f. o. b. Chicago, as follows:

Lake copper, carload lots, 17¼c; casting, 17¼c; smaller lots, ¼c to ¼c higher. Spelter, car lots, 6.90c to 6.95c; lead, desilverized, 4.45c in 50 ton lots; corroding, 4.70c; sheet zinc, 8.75c, f. o. b. La Salle, in car lots of 600-pound casks; pig tin, 46.50c; Cookson's antimony, 8¾c; other grades, 7⅞c to 8c.

Old Metals.—The demand for old metals in this territory continues to be very satisfactory to the dealers and there is comparatively little speculative trading. While some changes in quotations are evident, they are caused by individual conditions and do not indicate any change in market conditions as a whole.

We quote, dealers' selling prices, f. o. b. Chicago, as follows:

Copper wire, crucible shapes, 14½c; copper bottoms, 13½c; heavy red brass, 11¾c; heavy yellow brass, 9¼c; No. 1 red brass borings, 11½c; No. 1 yellow brass borings, 8¾c; brass clippings, 9¼c; lead pipe, 4c; zinc scrap, 5¼c; tea lead, 3¾c; No. 1 aluminum, 16c; No. 1 pewter, 30c; block tin pipe, 40c; tin foil, 37c; linotype dross, 3⅛c; electrotype dross, 3⅞c; stereotype plates, 4¼c; stereotype dross, 3⅛c; prime slab zinc dross, $100 a ton.

SCOTT WILL RETIRE

From La Belle Iron Works to Go to New Tin Plate Company.

Isaac M. Scott, president of La Belle Iron Works, Steubenville, O., will retire from that office to assume the active direction of the recently organized Wheeling Sheet & Tin Plate Co. Definite announcement to that effect is expected within a few days.

The new company was organized a few days ago with a capital of $750,000, all of which has been subscribed. Options have been taken on two tracts of land.

Mr. Scott is 46 years of age and began his connection with the iron and steel industry in 1883, in the shipping department of the Aetna Iron & Nail Co., Bridgeport, O. He continued with this company and its successor, the Aetna-Standard Iron & Steel Co., until 1893, serving as paymaster, invoice clerk, bookkeeper and assistant secretary. In 1893, he was elected secretary and treasurer of the Beaver Tin Plate Co., Lisbon, O. Five years later, he returned to the Aetna-Standard company as secretary, and a year later, when that company was acquired by the American Sheet Steel Co., he became auditor of the latter company. In 1903, he was elected treasurer of La Belle Iron Works, and was made president in June, 1904.

RECORD IS BROKEN

By Republic Company in Gross Tonnage Taken Last Fiscal Year.

Although the gross tonnage of business taken by the Republic Iron & Steel Co. for the fiscal year ended June 30, 1912, exceeded the record year of 1907, by 27.5 per cent, the total value of shipments made in that period was 7.6 per cent less than 1907, though 20.1 per cent better than 1911, according to the thirteenth annual report just issued. The tonnage of the past year increased 43 per cent over 1911. The gross volume of business for the past three years was $28,983,055.54 in 1912; $24,071,771.32 in 1911, and $28,296,265.97 in 1910.

Total profits for the year were $2,484,417.24, as compared with $3,845,000.32 in the year ended June 30, 1911, and $4,227,368.96 during the year ended June 30, 1910. The amount carried as surplus during the past year was $398,262.47, compared with $672,519.63 in 1911, and $1,233,119.66 in 1910.

A comparative statement of earnings and disposition of income for the three years past is as follows:

	1912	1911	1910
Gross profits	$2,484,417.24	$3,845,000.32	$4,227,368.96
Depreciation and charges	1,211,154.77	1,422,480.69	1,324,453.55
Net profits	1,273,262.47	2,422,519.63	2,902,915.41
Regular dividend	875,000.00	1,750,000.00	1,669,795.75
Amount carried to surplus	398,262.47	672,519.63	1,233,119.66
Amount specially written out of surplus	420,817.11	264,734.32	2,198,994.27
Balance surplus account	5,339,891.21	5,362,445.85	4,954,660.54

The amount expended for new construction during the past year was $1,521,322.92.

The unusual market conditions faced by the steel industry during the past year is summarized in the following statement by the executive committee:

"The fiscal year covers a period of lowest market prices ever experienced in the history of the company. General business conditions were most unsettled, the cost of labor high and general operating conditions of an adverse character.

"The general weakness and demoralized condition of the iron and steel market referred to in the semi-annual report of Dec. 31, 1911, was decidedly intensified by the introduction of new factors of business disturbance which had the effect of causing a further loss of business confidence. Under these conditions, producers of iron and steel, in order to stimulate an economic volume of business offered further price reductions, low ebb in values being reached during March. Under the influence of bargain prices and improvement in business sentiment, due in part to lessened activity of investigating committees and also to improved crop prospects, the volume of business was rapidly increased, reaching such proportions during April, that general price advances were stimulated."

Production has shown a large increase, and has been made while the entire character of the business was being changed from iron to steel and without interruption to regular operations. The iron ore output for 1912 totaled 1,722,495 tons, as compared with 1,861,185 tons for the previous year, while coke production amounted to 86,761 tons in 1912, compared with 723,859 tons for 1911. Other products follow: Pig iron, 1912, 1,007,849 tons, compared with 850,863 tons in 1911; Bessemer steel ingots, 1912, 655,673 tons, compared with 597,991 tons in 1911; open-hearth steel ingots, 1912, 307,815 tons, compared with 6,939 tons in 1911; finished and semi-finished products, 1912, 979,617 tons, compared with 684,553 tons in 1911. The tonnage on hand for the end of the fiscal year of 1912, while slightly below that reported for the previous year, has been booked under more stable market conditions, the current volume of business being larger with price tendencies upward. On June 30, 1912, there were 454,961 tons of unfilled orders of finished and semi-finished products, compared with 481,425 tons for the previous year. The unfilled tonnage of pig iron for June 30, 1912, was 96,935, compared with 102,077 tons for the preceding term. The totals of finished and semi-finished products include nothing but fixed contracts. The average number of men employed during the closing fiscal year was 11,723 with 11,588 in 1911.

Grants Lower Rates

Manufacturers in Savannah, Ga., who build railroad equipment, petitioned the interstate commerce commission for a rate of 22 cents per 100 pounds on iron and steel from Savannah to Norfolk, Lynchburg, Richmond and other Virginia cities. It is set forth that the same rate exists between the Virginia cities and Savannah. The commission granted the rate. The Savannah manufacturers want to extend their territory to Virginia, a field now supplied by Baltimore and Richmond.

MANY ORDERS

For New Ships Received by Coast Ship Yards.

Not since the Spanish-American war have the coast ship yards had on hand so many orders for new ships. There are altogether 56 freight and passenger steamers as well as 19 vessels of other kinds, such as colliers, tugs and lighters building, to say nothing of a naval program that embraces 45 vessels of all classes. It is stated that the New York Ship Building Co., Camden, N. J., has $25,000,000 worth of orders on its books and the total work in all grades is greatly in excess of $100,000,000. Obviously this means a great deal to the steel trade. The American-Hawaiian Steamship Co. is building eight vessels at the yard of the Maryland Steel Co., Sparrows Point, Md., which call for 7,500 tons of shapes and plates each. Cramps, Philadelphia, are building four for W. R. Grace & Co., of London, which call for an equivalent amount of steel and probably 1,500 tons would be a fair average of the amount of steel that will be worked into the remaining 44 vessels that are building for the coastwise, sound and river service, or 66,000 tons altogether. Additional orders are pending.

If congress could be persuaded to permit railroad-owned ships to pass through the Panama canal, the Pacific Mail Steamship Co. would immediately place orders for four steamers bigger than anything yet seen on the Pacific.

Ship construction for coast account is not confined altogether to the coast, as lake ship yards are building 15 vessels for salt water service—eight of them for the Standard Oil Co. and seven for new companies that have been formed in anticipation of the opening of the Panama canal.

Altogether the outlook for American ship builders is a good one.

Arrange Transfer

W. Sandford Poole and A. C. Whitmee were appointed joint liquidators of the Otis Steel Co., Ltd., at a recent meeting of the stockholders in London. They were authorized to divide among the contributories in specie, in proportion to their rights and interests in the assets, the company's holding of preferred and common stock of the Otis Steel Co., of Ohio. The change is made to formally give the company an American domicile.

OPERATES AT CAPACITY

Lake Superior Corporation Has Heavy Orders.

Toronto, Aug. 13.—The Lake Superior Corporation is now operating at capacity with a daily output of 1,000 tons of rails; 1,400 tons of pig iron and 1,500 tons of coke, in addition to other products. Orders now on hand are sufficient to keep the mills busy until the end of the year.

Canadian manufacturers of automobiles find an increasing demand for their output in New Zealand. The steamship Rakaia, which sailed from Montreal last week for that colony, carried a consignment of 155 Canadian-made autos. The demand is said to be due to Canadian cars being better adapted to the roads of New Zealand and Australia.

The town of Welland, which is becoming a large iron center, has adopted a by-law providing for an expenditure of $45,000 for a municipal electric plant, in connection with the provincial hydro-electric system, which will furnish power to any one requiring it. The Welland Terminals, Ltd., has been organized and has acquired a site of seven acres on which a concrete building covering 50,000 square feet will be erected. Floor space will be rented to small factories which do not want to erect their own buildings.

The Grand Trunk railway has entered into an agreement with the town of Prescott, Ont., under which it will remove its terminals from Brockville to Prescott within two years in consideration of a fixed assessment, cheap water and light and the construction of a subway by the town at a cost estimated at $25,000. The Grand Trunk binds itself to spend $150,000 in terminal facilities and has purchased or obtained options on 845 acres for new engine shops and yards. The change will involve the removal to Prescott of 500 men representing an annual payroll of $350,000.

To Elect Officers.—The meeting for the election of officers of the newly organized Michigan chapter of the American Mining Congress, will be held in Ishpeming, Mich., during the convention of the Lake Superior Mining Institute. This decision has been made by J. B. Cooper, of Lake Linden, Mich., acting chairman of the board of directors. J. F. Callbreath, secretary of the congress, will address the meeting.

Hattie Ensley furnace of the Sloss-Sheffield Steel & Iron Co., at Sheffield, Ala., which has been idle for some 12 months, is being repaired and will be blown in as early as is practicable. Prior to blowing out last year, this stack had been in almost continuous operation for a period of eight years.

OPPOSED TO PREMIUMS

Leading Companies Would Prevent Runaway Market.

New York, Aug 14. (By wire.)—Heavy new business in finished lines continues to be placed with certain makers. The Steel Corporations's August bookings continue to keep ahead of July. As showing a disposition to check anything that resembles a runaway market, some large companies are discouraging the payment of premiums and there are some cases the past week where extra prices offered have been declined and customers given desired deliveries at regular prices.

HIGHER PRICE

Paid for Southern Iron for Last Two Months of Year.

Chicago, Aug. 14. (By wire.)—A Rockford, Ill., sewing machine company has purchased 500 tons of southern No. 2 for November and December delivery at $12.50, Birmingham, 50 cents above prevailing quotations. The buyer tried to get this price for first quarter shipment, but was unsuccessful. There is no southern iron in this market for delivery next year and furnace books for this year are rapidly filling.

Southern Makers Cautious

New York, Aug. 14. (By wire.)—Leading makers of southern iron have been offered $12.50 for No. 2 for first quarter, but have declined the business because they are unwilling to freely make quotations into next year at this time.

British shipbuilding firms have been invited this week to tender for six armored cruisers of exceptionally high speed, all of which will be required to be in commission by June, 1914, says our Birmingham, Eng., staff correspondent. These vessels alone will materially add to the demand upon British steel mills during the next two years.

DOUBLE DECK CARS

Of Steel Construction Being Tried by New York Railway.

Successful experiments carried on by the New York Railway Co. with a center entrance stepless street car, has led that company to make a further trial with a center entrance, double-deck stepless car. A sample car of this type, built by the J. G. Brill Co., Philadelphia, was put in test service during the past week. The new car has a length over all of 44 feet 10 inches and a width of 8 feet 3 inches. The ceiling of the main floor is constructed to utilize all the space under the seats of the upper deck, which are placed back to back down the center line, enabling the passengers to face outward. In the center of the car, the distance from the main floor to the ceiling is 7 feet 6½ inches. From the sides of the main floor to the ceiling under the walk about the seats of the upper deck, the distance is 5 feet 2 inches, except at the entrance, where the ceiling is higher to allow passengers to board and disembark conveniently. The height of the upper deck is 6 feet 1 inch, and from the street level to the extreme top of the car, the distance is 12 feet 10 inches. The main structure and most of the equipment of the car are of steel. The seating capacity of the double-decked car is 88 passengers and the maximum capacity 171. A number of additional cars of the original single-deck, stepless design are now being built for the street railways of the metropolis to be delivered in the fall.

EXCURSION PROGRAM

Includes Visits to Washington, Pittsburgh and Buffalo.

A detailed program has been issued of the official excursion given following the sixth congress of the International Association for Testing Materials, to be held in New York, Sept. 2 to 7. The official excursion will start Sunday, Sept. 8, and will spend Monday and Tuesday in Washington, visiting many places of interest at the capital. Wednesday and Thursday will be spent in Pittsburgh. The plants of the National Tube Co., and Carnegie Steel Co., the government laboratories at the arsenal grounds, Carnegie Institute, and other places of interest will be visited. Friday will be spent at Buffalo. The plant of the Lackawanna Steel Co. will be inspected. Saturday will be devoted to Niagara Falls and vicinity.

Construction Features of a Modern Skyscraper

Steel Work Details and the Concrete Foundation

The erection of a steel frame structure inhabitable throughout its practically 800 feet of height demonstrates equally the marvelous potentiality of the modern structural steel section and the daring ingenuity of the latter-day engineer. The approaching completion of the 55-story Woolworth building in New York City, the tallest structure in the world devoted to commercial purposes, represents the achievement of a remarkable undertaking in building construction. This structural giant occupies a site bounded by Broadway, Park place and Barclay street, near the heart of the downtown section of the metropolis. Within the past few days the extreme pinnacle of the tower, 796 feet above Broadway, has been reached by the erectors and the steel work of the building, aggregating about 23,000 tons, is now practically all in position. The inclosing walls are well up on the tower which surmounts the main structure. The Woolworth building has been designed in two general parts, consisting of a main section occupying an area of 155 x 200 feet, 30 stories high, and a tower 84 x 86 feet and 25 stories high, built upon the main section. Originally a smaller site was in contemplation and the tower was designed to face the Broadway and Park place corner. Subsequently, additional ground was acquired and the building was enlarged to its present dimensions. The location of the tower was then moved to the center of the Broadway elevation. This modification of design made necessary some notable changes in the grillage and sub-structure arrangements of the building.

Gigantic Size of Structure

Statistical data regarding the building emphasize the gigantic proportions of the enterprise. By way of comparison, the extreme top of the structure is almost 100 feet higher than the Metropolitan Life Insurance building, facing Madison Square, and

FIG. 1—VIEW OF THE WOOLWORTH BUILDING, JULY 1, 1912. ON THIS DATE THE STEEL FRAMEWORK WAS PRACTICALLY COMPLETED. AT THE LEFT IS SHOWN THE TOWER OF THE SINGER BUILDING WHICH IS DWARFED BY THE WOOLWORTH TOWER

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more than 130 feet above the Singer building on lower Broadway, which have heretofore been the show structures of the metropolis. The Metropolitan tower is 700 feet, 3 inches and the Singer building, 665 feet above the street. The Woolworth building embraces practically 27 acres of floor space. For construction work alone, the cost was about $8,000,000 and for the foundation about $1,000,000. As the site is valued at about $5,000,000, the total investment aggregates about $14,000,000.

The weight of the building is carried by 60 main columns, each of which has a maximum load capacity of 9,500,000 pounds. The total load on the individual columns ranges from 2,500,000 to about 9,500,000 pounds and the wind load from 30,000 to 2,750,000 pounds. This total load is transmitted from the columns to 66 concrete piers which were sunk 115 feet below the curb to the solid rock by the pneumatic caisson process. The majority of these piers are circular in form with diameters ranging from 6 feet, 6 inches in the interior of the foundation, to 18 feet 9 inches at the front. Along the lot line the piers are rectangular and vary in size from 6 to 8 feet in width and from 11½ to 24 feet in length. By this means it was endeavored to bring the centers of gravity as near as possible to the centers of the wall columns. The largest columns in the building have a cross-sectional area of about 650 square inches. These are 44 x 36 inches in size and weigh about 2,000 pounds per lineal foot. The total pressure on the rock from the construction weight of the building is 340,000,000 pounds, of which 250,000,000 pounds is at the top of the piers and 90,000,000 pounds is represented by the concrete in the foundation piers. The 250,000,000 pounds pressure at the top of the piers is made up of 165,000,000 pounds, representing the weight of the building, 45,000,000 pounds, the floor capacity, and 40,000,000 pounds, the wind pressure.

Carrying these enormous loads to such an excessive height taxed the greatest engineering skill and required the most minute mathematical computation to work out the problems presented, since there are no precedents of experiences with such lofty structures to guide the work. The design of the building, as contrasted with other New York skyscrapers, has been much more complex, especially after the original plans were revised, and this condition has multiplied the engineering problems presented. With the Metropolitan building and Singer tower, an essentially simple and regular style of construction and design was followed.

All the steel columns are located on the pier centers, except the six in the west wall and eight in the tower. The footings for all the columns consist of cast steel pedestals varying in height from 18 inches to 3 feet. These are webbed throughout and vary in size at the base from 4 feet to 7 feet, 9 inches. Where cantilever girders were required, the pedestals were seated on their top flanges, but in all other cases they were seated directly on the upper tiers of the grillage beams. Their bases, in this position, are wide enough to distribute the load throughout this set of grillage beams. For the largest piers the grillage beams consist of four tiers and for the smaller piers, two tiers. When the design of the building was changed after construction had been commenced, the piers already sunk were utilized for eight of the tower columns through heavy triple girders seated on the original piers and upon additional piers which were constructed nearby. In this way the columns bearing the heaviest loads up to 9,423,000 pounds each, are carried.

The main columns on the north side of the building, which are concentric with the piers, rest on triple girders. The intermediate columns,

FIG. 2—DRIVING THE SHEET STEEL PILING WHICH ENCLOSED THE ENTIRE SITE OF THE BUILDING DURING EXCAVATION

FIG. 3—METHOD OF BRACING SHEET STEEL PILING AGAINST THE PERMANENT COLUMNS IN THE FOUNDATION

carrying lighter loads, are seated on single tiers of grillage beams. The columns in the west wall of the building, which are seated very close to the lot line, are supported on the short arms of double and triple cantilever girders, fulcrumed on the wall pier grillages and anchored at the extremities of the long arms by the adjacent, interior columns. The girders spanning two piers, 16 feet, 3 inches apart at the front of the building and upon which the tower columns with a maximum load of 9,423,000 pounds are seated, are about 8 feet deep, 6 feet, 9 inches wide and 23 feet long. The total weight of each of these girders is about 65 tons and there are eight of this size in the building. The girders have three webs, each reinforced to a total thickness of four inches, which are connected by six sets of vertical, transverse, ½ inch diaphragm plates, riveted between the flanges of vertical web angles. These girders were shipped complete from the shops of the American Bridge Co., where they were fabricated. It required the combined pull of 42 horses to draw these single girders, loaded on long trucks, through the streets of New York. The column pedestal is seated on an 82¾ x 82-inch bearing plate, countersunk-riveted to the top flanges. Similar plates are countersunk-riveted across the bottom flanges to rest on the grillage beams to insure solid bearings for the transmission of the heavy shearing stresses. The web plates were riveted with a projection ¼ inch beyond the backs of the flange angles, after which they were planed 5/16 inch on each edge, thus taking a 1/16 inch cut on the flange angle itself and providing a machined surface to receive the cover plates.

The six cantilever girders at the west end of the building for supporting the columns are designed to sustain loads of 3,260,000 pounds, 3 feet, 3 inches from their fulcrum resting on the wall pier grillages and have a reaction of 224,000 pounds, 16 feet from the fulcrum. These girders are 5 feet deep, 5 feet wide and 22¼ feet over-all and weigh about 35 tons each. They were shipped complete from the fabricating shop. The flanges and edges of the web plates were planed similar to the girders supporting the heavy columns between piers except that the intermediate, vertical, transverse diaphragms were riveted to one instead of two angles at each end.

The two corner columns in the Broadway face carry the maximum loads of the building. The tower column at the corner nearest the Barclay street corner of the building carries a load of 9,423,000 pounds. The corresponding tower column on the Broadway face has a load of 8,419,000 pounds. The other two corner columns of the tower bear about 8,000,000 pounds each. The distribution of the load of these columns is made through a grillage of four tiers of 24-inch I-beams with flanged reinforcement plates for the top tier and web reinforcement plates for the bottom tier. Six other columns have similar grillages, except that the I-beams are not reinforced. Eleven columns are seated on grillages of three tiers of 12, 15, 20 and 24-inch I-beams, 14 columns on grillages of one tier of 8 to 24-inch I-beams and the remaining columns on a grillage of two tiers of 12 to 24-inch I-beams. Six piers supporting columns in the Barclay street wall have no grillages and the column loads are carried by triple girders with webs 41½ and 57 inches deep and heavy reinforced flange angles, 8 x 16 inches, bearing directly on the reinforced tops of the piers. All the tower columns have a closed rectangular section of 650 square inches made up of three webs

FIG. 4—STEEL CONCRETE FORM AND STEEL REINFORCEMENT OF THE FOUNDATION PIERS

FIG. 5—ROW OF CIRCULAR CONCRETE PIERS UNDER CONSTRUCTION

and two covers each composed of several thicknesses of heavy plates, stitch-riveted and reinforced by pairs of full length angles on the center lines of the web plates. One of the cover plates on each side of these columns projects beyond the others to afford full-length, field-riveted connections to the double portal braces and a full length hitch plate extends from end to end of one side of the column on the center line. This plate is riveted between a pair of vertical angles on the center line of one side of the column to provide field-riveted connection for the single portal braces in the adjacent side of the tower. The basement section

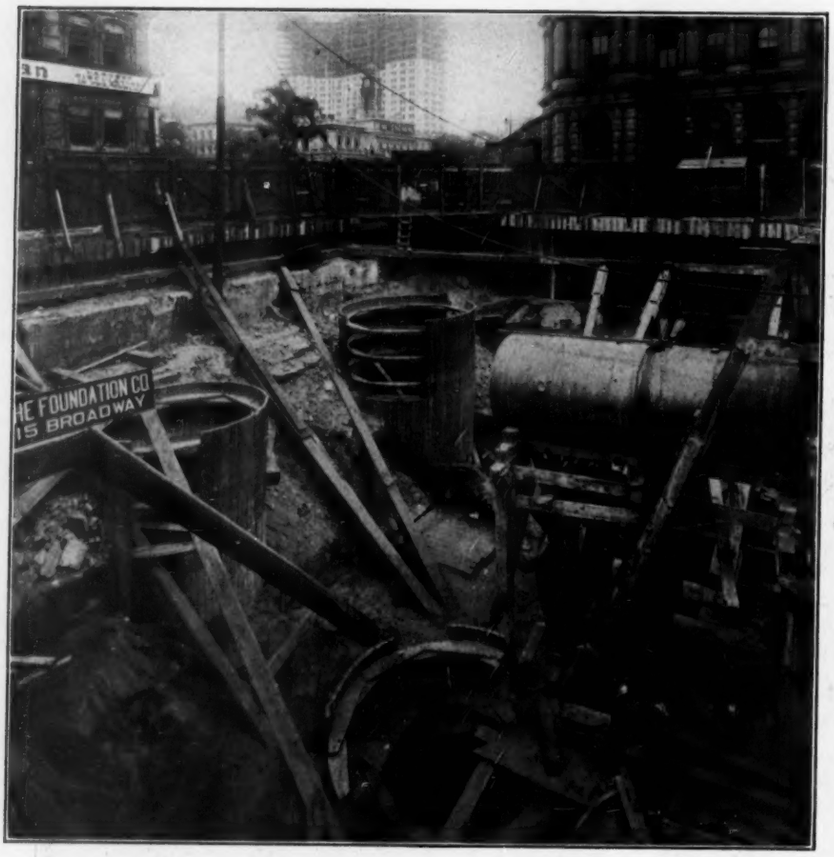

FIG. 6—ONE CORNER OF THE WOOLWORTH BUILDING SITE, SHOWING THE ENCLOSURE OF SHEET PILING. IN THE FOREGROUND ARE SHOWN THE STEEL AIR LOCK AND THE TOP COFFERDAMS OF THE FINISHED PIERS

of the column is similar to the sub-basement section, except that the number and dimensions of some of the plates are different. The area here is reduced somewhat to provide for the combined static and wind load of 9,265,000 pounds. The columns not in the tower have closed, rectangular cross-sections made of two built-up channels and cover plates with a maximum area of 297 square inches. Above the basement floors they are made in two-story lengths.

The wind bracing designed to withstand the enormous wind pressures, is one of the interesting features of the steel construction of the building. In none of the tall business structures of the metropolis has the system of bracing been carried out on such a complete scale as in the tower of the Woolworth building, with the exception of the Broadway front of the City Investment building. The entire wind stresses of the building and tower are carried by the wind bracing, no reliance being placed on the walls and partitions except those parallel to the long lines of the building. The tower is braced against the wind as if it were a separate structure. The two wings, 60 x 110 feet each, are connected by portal struts at every fifth story. All the transverse rows of columns in each wing are connected at every floor by double lines of continuous deep plate girders with gusset plate connections. The total wind loads to be taken care of reach the maximum of 2,750,000 pounds on single columns.

In the tower, the bracing from the top to the 50th floor is given by the inclined members of a pyramid roof. From the 50th floor to the 47th floor, the wind stresses are carried to the four interior columns with gusset plate connections to the floor girders. From the 47th to the 42nd floors, the wind stresses are conveyed through the outer columns with solid web, knee-braced connections to the wall girders. From the 42nd to the 28th floor, the wind bracing is composed of deep wall girders and knee braces. Below the 28th floor, it is made up completely of solid web, full-depth girder portals. The bracing of the west face of the tower is similar to the Broadway face. The bracing in the other two faces is also similar above the 28th floor. Below the 28th floor, the semi-portals in each side panel, combined with the deep wall girders in the center panel, make long single portals which extend across the full face of the tower instead of the three shorter portals in the other faces.

Portal Girders

On the Broadway front of the building, from the sub-basement up to the fourth floor, double portal girders are provided. The architectural design of the building for large openings at the lower front of the building has made necessary the omission of these portal girders at certain stages and this required an ingenious arrangement of the bracing by the structural engineers. The second and third floor girders are omitted in the center panel and the fourth floor portal is continued to the first floor. In the side panels the third floor portals are omitted and the fourth floor portals are continued to the second floor. The flanges are reinforced to the third floor level. The bottom flanges of the second floor portals in the side panels are reinforced nearest the center panel with flanged plates extending around the curved portion of the portal. In the basement and sub-basement, all portals are reinforced by the cover plates extending around the curved portion of the flange. Long and wide horizontal plates, field-riveted across both flanges of both center panel and side panel portals form the connection and this diaphragm is field-riveted to the columns. The portal webs are continuously field-riveted to the columns through the projecting cover plates of the latter. Single portals brace the panels from the 10th to the 27th floor. From the 28th to the 40th floor, inclusive, every panel of the Broadway face of the tower is braced by wall girders, 3 feet, 9 inches deep. The ends of the girder webs in the center panel are cut short and are spliced by double cover plates, field-

riveted to large gusset plates, which project beyond the top and bottom flanges of the girders and act as double knee braces to the columns on which they are shop-riveted. The bottom flanges of the girders are field-riveted both to the gusset plates and to horizontal shelf angles, shop-riveted to the latter. The girders in the side panels are field-riveted at both ends to connect angles shop-riveted to the columns. These have no gusset plates, but are knee-braced at the outer ends by pairs of channels back to back, field-riveted to special sections of the girder webs projecting near the middle. The opposite ends of the braces are shop-riveted to connection plates which are field-riveted to the columns.

The tower has two offsets, one of seven feet at the 42nd story and one of five feet at the 47th story. Upward from the 42nd story, the wall girders are increased to a depth of 4 feet and the knee braces are omitted. Eight and nine-foot girders are used on the 42nd floor. In both the center and side panels, the girder webs are cut short at the ends and are field-riveted through double cover, spliced plates to long gusset plates which are shop-riveted to the columns. These plates extend 4 feet below the bottom flanges of the girders and receive the beams in the pipe gallery floor.

Wall Girders

From the 43rd to the 46th story, inclusive, the wall girders have a uniform depth of 3 feet, 9 inches. They are connected to the columns through gusset plates projecting beyond the top and bottom flanges, forming knee braces in the center panel and at one end in the side panels. The other ends of the side panels are connected directly to the columns through hitch angles. In the 48th, 49th and 50th floors, the deep girders in the longer center panels and the shallow girders in the short side panels are connected to the two intermediate columns by gusset plates projecting beyond the bottom flanges. The bracing in the four lines of columns perpendicular to the Broadway side of the tower consists of plate girder portals similar to those in the Broadway front, except that they extend across the full three-panel width of the tower. The portals are double to the fifth floor and single above that level. In one of the intermediate rows of columns, the first floor portal is omitted to provide for a two-story room.

Wherever it has been permitted by the architectural design, diagonal braces have been utilized and considerable economy was effected in the use of this lighter and more simple construction. This diagonal bracing has been used below the fourth floor in the west face of the tower. Above that level, the bracing is the same as in the Broadway face. These braces are made up of two pairs of angles, back and back, connected by tie plates and shop-riveted at the lower end to special sections of the wall girder web plates projecting above their top flanges. These serve both as connection plates for the braces and as knee braces for the girder. The upper ends are field-riveted to web plates, projecting below the bottom flanges of the girders at their center points. The basement and first floor girders are of the plate type, 38 inches deep, and those in the second, third and fourth floors have pairs of 15-inch angles back to back.

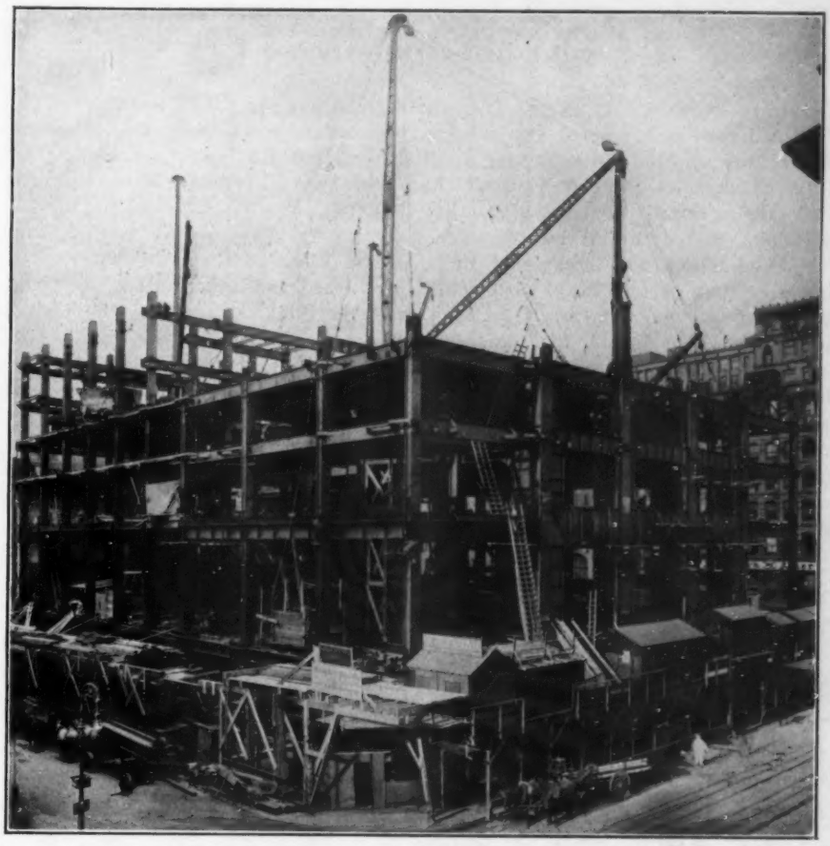

FIG. 7—STEEL CONSTRUCTION OF THE LOWER FLOORS, SHOWING THE WIND BRACING OF THE TOWER SECTION AT THE RIGHT

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In the construction of the foundation, about 20,000 square feet sheet steel piling was used for retaining walls to support the exposed parts of Broadway, Park place and Barclay street pending the construction of the permanent foundations. In this work, 580 lineal feet of 25 and 40-foot bars of Lackawanna piling, were used together with a considerable quantity of United States piling. The line of piling was driven one foot outside the position of the foundation wall and will remain in position permanently. The penetration averaged 32 feet, the maximum of which was 43 and the minimum 29 feet, largely through coarse sand. The piling wall was temporarily braced at the top during the latter stages of excavation by waling supported by long pushers heeled in the sand. The soil near the bottom of the piling wall was left in place until after the erection of the permanent columns. Then, as excavation near the wall proceeded, rows of waling were spaced against the piling, varying from 4 to 7 feet apart and these were braced against the permanent columns by 12 x 12-inch yellow pine timbers. The columns in turn were braced against the next inner row of columns.

The fabrication and erection of the steel work of the building was completed in an unusually short time. The American Bridge Co., which fabricated the steel at its Ambridge and Pencoyd plants, followed a regular schedule of deliveries laid out by the

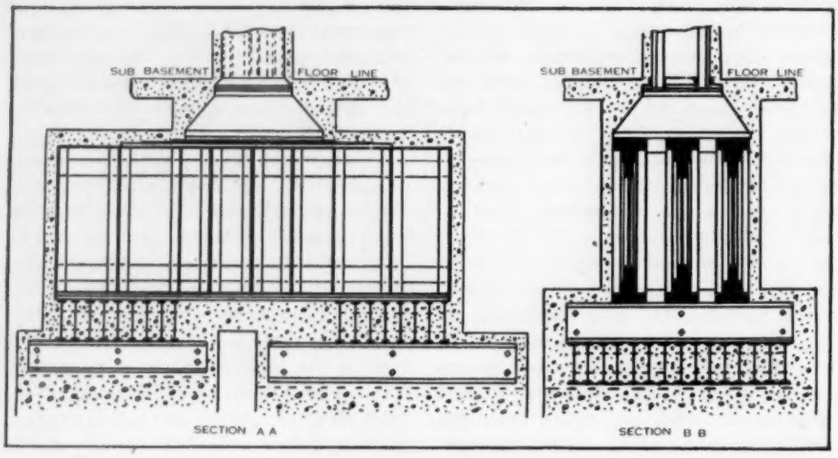


FIG. 8—FRONT AND SIDE ELEVATIONS OF THE LARGEST GIRDERS SPANNING PIERS AT THE FRONT OF THE BUILDING. TWO TIERS OF GRILLAGE BEAMS WERE USED

engineers and the last piece of steel was delivered and erected two weeks before the allotted time for the job. The Thompson - Starrett Co., which had the general contract for the building, erected the steel framework. The foundation was completed during the latter part of May, 1911. The final delivery of the steel sections was made about July 1, 1912, and the last rivet was in place a few days later. July 15 had been originally fixed as the time when all the steel work was to have been delivered and erected. Gunwald Aus, New York, was the consulting and designing engineer for the steel construction and foundations of the building. The foundation work was done by the Foundation Co. and Cass Gilbert, of New York, is the architect of the building.

The value of the gold, silver, copper, lead, and zinc output in Colorado in 1911, according to the United States geological survey, was $32,418,218, as compared with $33,673,879 in 1910, a decrease in value for the year of $1,255,661. The output of gold decreased by $1,505,083; silver by $710,194; copper by $58,600; and lead by $211,568. The output of zinc increased by $1,229,784.

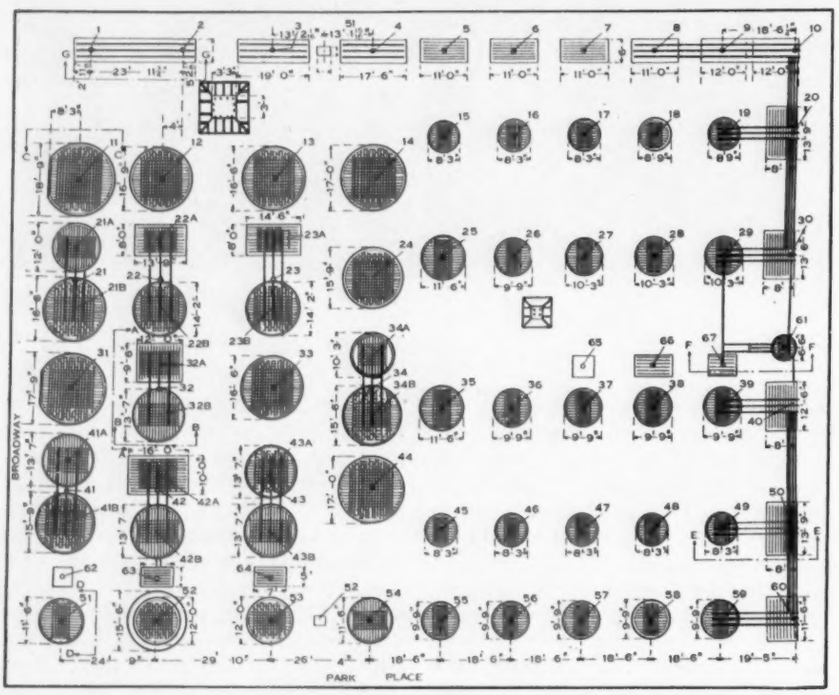


FIG. 9—FOUNDATION PLAN, SHOWING ARRANGEMENT OF 60 MAIN COLUMNS CARRIED ON 66 PIERS. COLUMNS 21, 22, 23, 32, 34, 41, 42 AND 43 CARRY LOADS OF 9,423,000 POUNDS EACH. COLUMNS 20, 30, 40 AND 60 ARE SEATED ON CANTILEVER GIRDERS

A New Differential Recording Gage

The Industrial Instrument Co., Foxboro, Mass., is now manufacturing a new type of differential recording gage. For ranges below 10 pounds per square inch a diaphragm tube is employed and for differential pressures exceeding 10 pounds per square inch a helical tube movement is utilized. In both, the pen arm is directly attached to a shaft affording substantial support and rigidity to the movement. A friction joint is

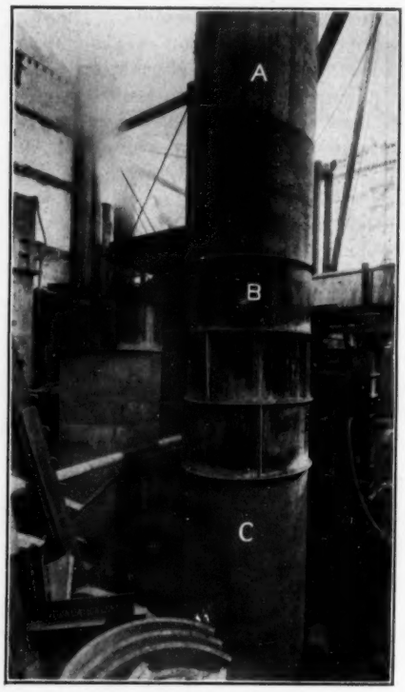


FIG. 10—WOOD TOP OF COFFERDAM AT *A*; STEEL FORMS FOR PIER AT *B*, AND *C* IS THE CONCRETE PIER WITH THE STEEL FORM REMOVED

supplied in the pen arm, making adjustments possible where necessary without affecting the length of the pen arm.

Transmission from the movement to the pen arm is obtained through a special bearing extending through the wall of the chamber enclosing the movement. There is practically no limit to the range of the difference or static pressure under which this recorder can be successfully used and it is especially adapted for measuring the flow of fluids by means of Venturi or Pitot tubes. One useful application is for recording the height of water in a boiler. When applied to the water column, the recorder gives a record not only of the height of water, but also an accurate record of the time the water column or gage glass is blown, the time and

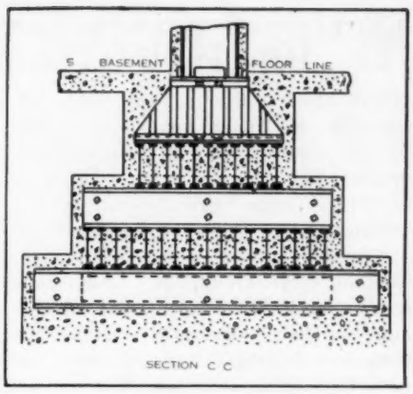


FIG. 11—GRILLAGE OF FOUR TIERS OF BEAMS FOR LARGEST PIERS

amount the boiler is blown off, and any other disturbance affecting the height of water in the gage glass. The recorder may be placed at a distance from the boiler. The continuous record will induce uniform conditions of water level and will serve as an efficient check against unsafe high or low water.

Carnegie Steel Sheet Piling

The ninth edition of the steel sheet piling booklet issued by the Carnegie Steel Co. has been re-written throughout and has been increased from 16 to 88 pages. On December 23, 1904, the first steel sheet piling was rolled by the Carnegie company and since that time the use of this product has passed the experimental stage and steel sheet piling is recognized by engineers generally as an efficient and reliable tool in subaqueous construction. In the course of experience in its manufacture and in contact with its actual use, the Carnegie company has acquired a large amount of information as to the successful accomplishment of the most varied classes of construction in which steel sheet piling has been employed. The illustrations of the methods of driving and pulling steel sheet piling, together with the notes of its uses contained in the booklet are all based on that experience.

In addition to the tables and data referring directly to steel sheet piling and its uses, there have been included for the convenience of engineers, notes and a few tables on concrete, earth pressures, etc. Most of the tables are original and were either computed at first hand for use in this book or were compiled from a comparison of similar data in standard engineering works.

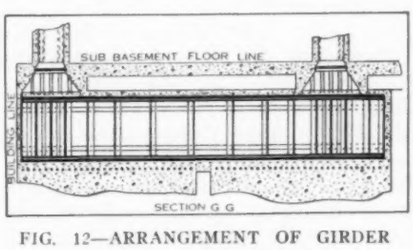


FIG. 12—ARRANGEMENT OF GIRDER SPANNING PIERS WHICH HAVE NO GRILLAGES

Efficiency of Automatic Sprinklers

Many fires have been put out recently by a single automatic sprinkler. A late case, on the second floor of the factory of the Inlaid Co., Providence, R. I., is supposed to have been caused by friction between a pulley and a wooden box. The ringing of the sprinkler alarm called attention to the fire and the city fire department was summoned. When they arrived the only work left for them to do was to turn off the water and replace the head which had fused.

Spontaneous combustion in the buffing room of the Champion Stove Co., Cleveland, opened one sprinkler head which promptly put out the fire. A partition wall was slightly scorched, the damage being so slight that no claim was made for insurance.

Similar results were reported by the Illinois Boxboard Co., the Rice Electric Excelsior Co., the Wooster Brush Co., the Oakland Cotton Mills, the American Brass Co., the American Locomotive Co., Parks Bros. & Rogers, the Hatfield Automobile Co., the Electric Storage Battery Co., R. H. White & Co., the Indianapolis Bleaching Co. and the Wilkes-Barre Lace Mfg. Co. These are only a few, chosen as showing the great variety of industries protected by sprinklers. In each of these cases the fire was put out by a single sprinkler head.

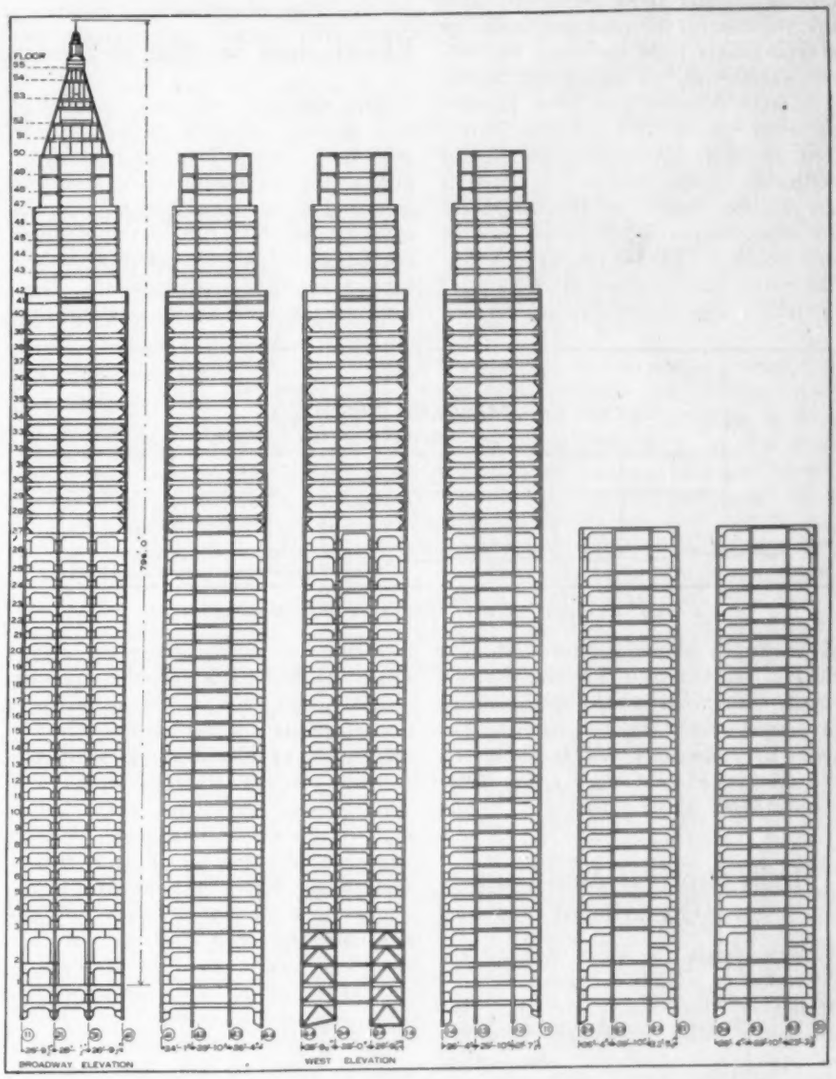


FIG. 13—DIAGRAM SHOWING THE TOWER WIND BRACING OF THE WOOLWORTH BUILDING

Secondary Tin Recovery

The United States uses between 40 and 50 per cent of the world's production of tin but mines only a small quantity. In 1911, according to the United States geological survey, the output of tin ore in this country was equivalent to 63 tons of metallic tin, valued at $54,013. The secondary tin recovered in 1911 was a little more than 27 per cent of the tin imported into the United States during the year. The amount recovered from babbitt metal, bronze, solder, from scruff and drosses that are formed in making tin and terne plate, and from the tin content of products made by several plants from tin scrap was 14,706 short tons, valued at $12,353,040.

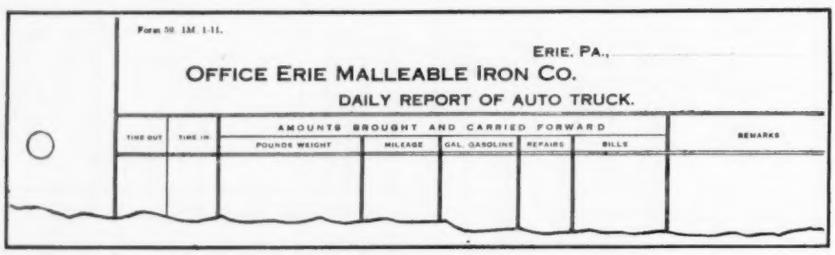
In both quantity and value the imports of tin in 1911 exceeded previous imports. According to figures collected by the bureau of statistics the United States in 1911 imported for consumption 53,527 short tons of tin, valued at $43,346,394, against 52,528 short tons, valued at $33,913,255 in 1910. The world's supply of tin, as shown by shipments for 1911, was 122,752 short tons. To the world's supply should be added the quantity of secondary tin recovered during the year—approximately 30,000 short tons—making the total supply for 1911, about 153,000 short tons.

Daily Report of Auto-Truck Operation

To ascertain the exact cost of the operation of its motor truck, the Erie Malleable Iron Co., Erie, Pa., has devised a daily report sheet, shown in the accompanying illustration, which is filled out by the driver and covers practically every item of interest pertaining to the operation of the truck. Columns are provided for entering the time when the truck leaves the foundry and returns and an accurate record is maintained of the weight of the material carried on each trip. Columns also are provided for the mileage covered, gasoline consumed, cost of repairs and other expenditures.

Ths daily report blank has enabled the company to compile interesting statistics covering the cost of operating its 1½-ton truck and the following data covers one year's operation:

Total mileage, 7,219½.
Average length of haul, 1.58 miles.
Total cost of gasoline used, $98.30.
Total cost of oil used, $55.83.
Total cost of tires, tubes, etc., $331.32.
Treads, $142.78.
Garage supplies, $25.25.
Repairs and overhauling, $28.36.
Wages, $780.
Insurance, including liability, collision and fire, $178.
Depreciation, $500.
Total cost of operation, one year, $2,114.77.
Tire expense, per truck, per mile, $0.0656.
Total weight hauled, 2,449 tons.
Total cost of operation per ton mile, $0.0576.
Total cost of operation per mile, $0.2928.


Form 50. I.M. 1-11.

ERIE, PA.,

OFFICE ERIE MALLEABLE IRON CO.

DAILY REPORT OF AUTO TRUCK.

TIME OUT	TIME IN	AMOUNTS BROUGHT AND CARRIED FORWARD					REMARKS
		POUNDS WEIGHT	MILEAGE	GAL. GASOLINE	REPAIRS	BILLS	

DAILY REPORT BLANK OF AUTO-TRUCK OPERATION

Electric Iron Smelting in Sweden

The directors of the Uddeholms Co., Sweden, propose to largely extend their electric iron smelting operations. At the Hagfors works of this company a furnace of 3,000 horsepower capacity has been in operation since the middle of March, while a second furnace recently was completed. The results have been so satisfactory that the directors contemplate an expenditure of $1,500,000 for the erection of additional iron smelting furnaces and an electric power plant. The intention is to install three additional furnaces at the Hagfors works and three at the Nykroppa plant. The electric process had reduced the consumption of charcoal in iron manufacture by approximately two-thirds and a large amount of wood hitherto consumed for iron smelting now becomes available for the company's increasing wood pulp manufacture. It is proposed to erect electric power plants at several falls owned by this concern. The smelting furnaces operated by this company are of the Electro-Metals Co. type.

The Davis & Furber Machine Co., North Andover, Mass., recently placed in operation its new core-making and brass melting departments. Melting furnaces and reel type core ovens, built by the Rockwell Furnace Co., New York City, have been installed.

Spelter Production During the First Half of 1912

The United States geological survey has just made public the statistics of production of all zinc smelters operating during the first six months of 1912. These figures show that the production of spelter from domestic ore in that period was 159,952 short tons, and from foreign ore 6,544 short tons, a total of 166,496 tons of primary spelter, compared with 140,196 tons for the first half of 1911 and with 146,330 tons for the last half of 1911.

If the production for the remainder of this year keeps pace with that of the first six months the output for 1912 will be about 330,000 tons, approximately 46,000 tons greater than the production in 1911, and more than double the production of any year prior to 1904. The apparent consumption for the first six months of this year was 159,046 short tons, against 145,157 tons for the last half of 1911 and 134,902 tons for the first half of 1911.

There was a falling off in the imports of zinc ore during the period, 27,049 short tons, containing 12,228 tons of zinc, having been imported in the first six months of this year, against 38,097 tons of ore, containing 17,112 tons of zinc, in the last half of 1911, and 37,885 tons of ore, containing 15,028 tons of zinc, in the first half of 1911.

Kansas led in the quantity of spelter made in the first six months of 1912, with 52,485 short tons; Illinois was next, with 44,224 short tons; Oklahoma third, with 36,010 short tons; the remainder, 33,777 short tons, having been supplied by the other spelter-producing states.

The price of spelter ranged from 6.25 cents a pound at St. Louis in January to 7 cents in June. As the average New York price for January was but 0.79 cent a pound higher than the average London price for January, and as the duty on spelter is 1.375 cents a pound, it is interesting to note that the monthly summary of the bureau of statistics for January gives the imports of spelter for that month as 4,377,360 pounds.

The gold and silver production in New Mexico showed an increase in 1911, that of gold $280,384, and silver $272,153. Copper decreased, as compared with 1910, to the value of $78,897; lead $56,637; and zinc $393,240. The total value of the metal production of New Mexico increased, as compared with the 1910 figures, by $13,763.

Growth of the By-Product Coke Industry

Its Tremendous Development in the United States in Recent Years and the Economies Effected by This Type of Ovens

By William E Hartman

The by-product coke industry has made such remarkable progress in this country in the last few years that one hesitates to write anything on the subject. His views at present may be so radically modified by subsequent improvements in the art that he is in great danger of being out of date before the expression of his views are forgotten.

This impetus of the by-product coke oven business is largely due to the progressive action of the United States Steel Corporation, and the beginning of the real growth of the business may be dated at the time when, four years ago, the Steel Corporation's coke committee investigated the different types of by-product coke ovens in Europe, and as a result built the plant of 280 ovens at Joliet, Illinois. This coke oven installation has, it may be truly said, set the pace for the industry in this country, and we are also safe in saying that the results obtained in this plant excited the envy and admiration of European operators. That the coke committee of the Steel Corporation decided wisely, can be best judged by the fact that the Corporation has since invested about $10,000,000 more in the construction of its Gary, Ind., and its Cory, Ala., coke plants.

Conserving Natural Resources

It is gratifying to note that this country is adopting industrial methods conducive to the preservation of its natural resources, but it may be remarked in this connection that the broad minded principle of conservation alone is not the actuating force behind this movement. It may be said that this is only incidental. The main argument for by-product coke ovens with the business man is the economy involved. If in the keen competitive struggle for business, it were cheaper to make beehive oven coke than by-product coke, the growth of the by-product oven industry would be exceedingly slow.

One element which has been instrumental in retarding the by-product coke oven, has been the prejudice regarding the quality of the coke produced. It cannot be absolutely stated that this prejudice was without foundation. Only in recent years have by-product ovens been built which could make coke superior in every way to the beehive product. The coke consumer had, and may still in some instances have, good cause for complaint on the score of lack of uniformity and black ends.

Uniform Heating of Ovens

The prime requisite in by-product oven coking, is uniformity of heating throughout the length of an oven, thus producing coke uniformly coked in a minimum length of time. An oven that is designed to accomplish this purpose to perfection, can be operated on the shortest possible coking time, this coking time being limited only by the refractory qualities of the construction material. Without this uniformity of heating, it is impossible to make any decided reduction in coking time, because of the danger of either over-coking or under-coking some of the charge, both of which faults are detrimental to the quality of the coke. Another feature of over-coking, sometimes encountered, is the difficulty of pushing the charge, due to the excessive amount of fracture resulting in fine coke or breeze.

That quick coking time is an advantage in by-product coke oven practice, is evidenced by the experience of the last few years. It has been found that reducing the coke time from 24 hours to 16 hours for the charge results in a considerable improvement in the coke, this result being testified to by the blast furnace departments. Shortening the coking time increases the porosity of the coke without decreasing its crushing strength. The product is, therefore, better adapted for furnace use. In this connection, we may say that the company with which the writer is connected has recently contracted with the Woodward Iron Co. for 80 13¼-ton ovens, with a guarantee of 15 hours coking time, and the writer confidently believes that he will, before long, see the time when by-product coke ovens are operated on 12 hours coking time.

Such results could not be accomplished were it not for the introduction of silica material in oven construction. The Steel Corporation's Joliet plant was built with one of the four batteries of silica material, and this was merely an experiment. By silica material we mean material with about 96 per cent SiO_2. There was great fear of the danger due to this highly expanding brick, which expansion is about ⅛ inch to the foot, and in the length of the 70-oven battery there was 35 inches of expansion to be taken care of.

It was predicted and expected by some coke oven people, that the end ovens of the battery would be pushed off the foundations, but we are glad to say that we were able to take care of this pronounced expansion. The great advantage of this highly refractory material is the fact that we are able to increase the coke temperature in connection with decreasing the coking time, without the danger incidental to the use of less refractory material. Therefore, we would say that the advance in the industry is due largely to the possibilities resulting from the adoption of silica material.

Size of Ovens

Another feature of note in by-product coking, is the increase in the size of ovens. The ovens built at Joliet in 1907-1908, were designed with a capacity of 10½ tons per charge, and these were then considered large ovens. The ovens of the same type, built since this, have been 12¾ or 13¼ tons capacity per charge. Our standard oven at this date is 15 tons per charge. This increase in the size of the ovens has an important bearing on the operating cost, and, therefore, it is an element of progress in the industry, but it is worthy of notice that it would be folly to try to make such decided increases in oven capacity unless the design of the oven provided for uniformity of coking throughout the length of the oven. This 15-ton oven is 40 feet

[1]Presented before the Engineers' Society of Western Pennsylvania.

long between doors, 11 feet high, and has an average width of 19 inches.

In the last few years there has been a decided increase in the number of ovens built to a battery. Formerly a 50-oven battery was considered a maximum. The Steel Corporation started out in its first plant at Joliet with four 70-oven batteries and followed this arrangement in its Gary, Ind., and Corey, Ala., plants. However, it is worthy of note that its Duluth, Minn., plant will have a battery of 92 ovens. The largest number of ovens that has ever been built in one battery is a recent installation of Koppers' ovens at Kaiser-Freiderich Colliery, near Dortmund, Germany. Here they have 120 ovens in one battery and they experienced no expansion difficulties in heating up the installation. It is evident that increasing the size of the battery decreases the construction cost, as well as the operating cost. There is no reason why these longer batteries cannot be successful in every way, provided proper construction precautions are taken for the expansion of the material.

First Cost of By-Product Coke Ovens

When beehive ovens can be built for $700 to $800 per oven, including all machinery, while a by-product oven plant costs $12,000 to $18,000 per oven, and the oven battery itself costs about half of this, it is not to be wondered at that the appearance of the first cost is discouraging. But on further consideration we find that the beehive oven receives a charge of perhaps 6 tons of coal every 48 hours, while the up-to-date by-product coke oven cokes its charge of 15 tons in from 15 to 18 hours. Considering a by-product oven of this size and this coking time, it has been found that the cost of construction of a by-product oven is about the same, or a little less than the cost of the beehive oven, figured on the basis of coke production. By this we mean that the cost of the by-product oven battery, including all of its machinery, piping, etc., but excluding that part of the plant for handling and recovering the by-products, compares favorably with the total cost of a battery of beehive ovens, when figured per ton of coke produced. This may be surprising to many, but it is one of the results of the recent rapid progress in the industry, and it is only possible with a large oven coking its charge in the short time mentioned. Thus, we are gratified to be able to say that the first cost obstacle has been overcome, considering the oven installation alone.

We are frequently asked what life we can count on for our ovens, and in general we will say that this is a difficult question to answer. In other words it is difficult to figure on the possibilities of the varying operating conditions. We have batteries that have been in operation 10 years without any oven wall repairs. We specify oven walls because aside from minor repairs, the walls receive the most severe treatment. Again, the writer saw a plant in England where it is necessary to rebuild the oven walls about every two years. This latter exceptional case is due to the fact that the coal used is high in alkaline salts, which unite chemically with the silica of the wall brick. We have some coals in this country that would result in this same difficulty, and this is one of the characteristics of a coal which we investigate in our preliminary laboratory examination of a coal sample. However, the most of our coals are low in alkaline salts and we can figure on a reasonably long life for oven walls. The battery of silica material ovens at Joliet has been in operation now for about 3½ years, and to all appearances it is good for at least 3½ years more without repairs; in this connection it may be said that this plant in three years produced as much coke as was guaranteed and expected to be made in five years.

Coal Used

Due to the Steel Corporation's experience with low volatile coal at Joliet, it has come to be generally believed that the best quality of blast furnace coke could only be made by using a low volatile coal, or mixture of coals. The coal used at Joliet was for a long time, 80 per cent Pocahontas and 20 per cent Ronco, making the volatile content of the mixture about 20 per cent. More recently Illinois coal was substituted for the Ronco, and more recently still, they had a month's run of 60 per cent Pocahontas and 40 per cent Klondike. This mixture had a volatile content of about 25 per cent, and it is interesting to note that this coal mixture produced coke far superior to that formerly made. The porosity was higher and the blast furnace results were decidedly improved.

There is a by-product coke oven plant at Duluth, using in the ovens ¾ inch screenings from Pittsburgh coal. This has a volatile content of 34 or 35 per cent, and the coke gives very good results in their blast furnaces, the blast furnaces being relatively small.

In Germany there are a large number of plants operating with washed coal containing from 10 to 12 per cent moisture, and from 14 to 16 per cent volatile matter. It is not generally known that coal of this kind can be used without having trouble from expansion during coking, but we have no such difficulties, and we attribute it largely to the fact that the coking processes take place uniformly throughout the length of the oven, and thus we have no part of the charge overcoked. This over-coking would result in excessive formation of breeze, which would interfere with pushing the charge.

Specific Gravity of Coal

The specific gravity of the coal has an important bearing on the process. We have several plants operating in England using very light coal and the volatile content is about 30 per cent. In order to make metallurgical coke from this light coal, it is necessary to compress the coal by stamping it into a cake before charging, while in this country there are a number of plants making good metallurgical coke from 30 per cent volatile coal without any such troublesome treatment of the coal before charging.

Another important characteristic of coals is the oxygen content. A coal that is high in oxygen requires a relatively high temperature and longer time for coking, and gives trouble through an excessive formation of carbon in the oven and pipes. Also, the gas yield is lower and the quality of the gas is poorer, so that all things considered it has been found that high oxygen in coal is much more objectionable than high ash content.

This country is as yet rich in coals of the first quality, requiring no washing to make them suitable for the manufacture of high grade coke, but there are, nevertheless, a number of coals relatively high in ash and sulphur, which are decidedly improved by washing, and again there are coals high in ash and sulphur, with these objectionable elements in such a condition that their percentage cannot be materially lowered by washing. If coals are washed they should be well drained so as to bring the percentage of water down to 7 or 8 per cent. This is not essential but is desirable. In many cases it is unnecessary to crush the coal very fine before washing, and in such cases the draining of the water is facilitated by the size of the coal.

In cases where it is desirable to mix two kinds of coal, it is advisable to crush the coals very fine in order to get an intimate mixture of the two kinds. This crushing is usually done with hammer mill crushers, to a degree of fineness of 85 per cent through an ⅛ inch mesh screen. Also, if we are using a coal containing small pieces of slate this degree of fine crushing will grind up the slate with the coal, producing a homogeneous mixture and avoiding cross fractures in the coke, which otherwise might be caused by the slate. When the coal is to be pulverized we usually install a Bradford breaker to break up the lumps to about 1¼-inch size and to remove refuse. Following the Bradford breaker, in some instances, we have installed a magnetic separator to remove small iron refuse and thus protect the hammer mill crusher following next in series. However, it is worthy of note that the largest by-product oven plant in the world, that is the Gary, Ind., plant, is preparing its coal successfully without the use of magnetic separators. In place of this they have each of the hammer mill crushers provided with a pocket, which catches iron refuse and which can be dumped at intervals. The mixing of coals is most efficiently done after crushing, and usually a plant is provided with two mixing bins from which the crushed coal is fed onto belts, which belts discharge into one chute, provided with paddle wheel mixers. The mixed coal is then elevated to a storage bin located above and to one end of the oven battery. From this bin the charging larry is supplied.

Quenching and Preparation of Coke

The proper quenching of coke from by-product ovens is accompanied by some difficult features. The coke, of course, is quenched outside of the ovens, and it is essential that the moisture content of the quenched coke should be very low. In Europe the writer found most of the plants pushing their coke onto a wide level wharf. Here the coke was quenched with a hose and wheeled by barrows into railroad cars. In some cases this was improved by having an inclined wharf, thus reducing the labor item. It may be said that this method did not result in low moisture coke, and would be, with our high cost of labor, an expensive method of handling. In this country we have had the greatest amount of success by using a quenching car. The coke is pushed directly from the ovens into a long open car, preferably lined with cast iron. In such cases the coke is quenched by a large overhead stream, immediately after the coke falls into the car. It is advantageous to quench the coke as soon as possible after pushing, in order that its heat may be sufficient to drive off excessive moisture, and experience teaches us that if the coke is quenched immediately after pushing it will not retain an excessive amount of moisture, no matter how large a stream of water is used. It has been found, however, that quenching the coke right at the ovens is open to objections, because of the large amount of steam produced, this steam having an injurious action on the oven steel-work and brickwork, as well as being disagreeable to the operators, so that the tendency now is to push the coke into such an open quenching car and immediately take this car away to be quenched at a quenching station slightly removed from the battery. In either case it is essential that the quenching stream be large in volume and quickly and thoroughly applied. By this method coke may be quenched so as to have not over 2 to 4 per cent moisture. It has been recently suggested that quenching can be still more efficiently accomplished with lower resulting moisture, if hot water is used, and we may say we are experimenting along this line. The necessity for further improvement in our quenching methods is evident, from the fact that one by-product coke oven plant has recently contracted for a part of its output on a moisture specification of 1 per cent.

It has only recently been demonstrated that it is poor policy to use run-of-oven coke in blast furnaces. Plants are now being equipped with facilities for screening, and in some cases for crushing and screening their product. Regarding screens, various types have been used, including straight bar, shaking bar and revolving screens. Of these, the revolving screen is without doubt the most efficient. A revolving screen not only screens thoroughly but also breaks off any loose particles of coke which would otherwise become fine coke in the blast furnace or cupola. The Steel Corporation's coke plant at Joliet and its blast furnaces have demonstrated that it is exceedingly advantageous to use only thoroughly cleaned coke, reduced in size to 2 inches or less. This plant is not equipped with crushers, but the coke receives severe dropping treatment before it is screened, and is thus broken up just as effectively as though crushers were used. Other furnace operators around the country have arrived at the same conclusion, and are equipping to reduce the size of their product for blast furnace purposes. In some cases coke is elevated for this treatment, by means of belts, but the heavy maintenance incidental to this method of elevation is leading to the use of skip hoists for this purpose.

One of the great advantages of the by-product oven over the beehive, is the increase in coke yield. This amounts to 5 to 10 per cent of the coal carbonized, and is due not only to the fact that there is no combustion of the coke in the by-product oven, but also to the fact that part of the heavy volatile matter in the by-product oven is converted into coke.

By-Product Apparatus

The last few years have seen a decided improvement in the apparatus for handling the by-products from coke ovens. Previously plants were more or less complicated, and the operation of the by-product plant required so much care and technical ability, and was involved in so much mystery as to be a drawback to the introduction of by-product oven plants. The men who had operated beehive ovens rather dreaded the prospect of operating the by-product end of a by-product oven plant, but the last few years has seen the introduction and eminently successful operation of our direct process for handling and recovering by-products. The simplicity of this process is such that when a plant is started with inexperienced men and with only one man to give them proper instructions, the operation is perfectly smooth and the best quality of by-products is turned out from the beginning.

Market for By-Products

It has been predicted that with the increasing introduction of by-product ovens, the market prices of tar and ammonium sulphate would be rapidly lowered. This has been predicted for the last 10 years, and yet the fact is that prices for these products have been steadily increasing. This is explained by the rapid development of the market, due to the increasing uses for these products. One of the recently developed fields for coke oven tar is its use in Diesel engines, and it may be interesting to some to know that engines of this type, of a capacity of 5,000 horsepower and over, are in successful use on tar. Tar is previously treated only for the removal of water. Regarding the surplus gas it has been found that this can be advantageously used wherever gaseous fuel, either producer gas,

blast furnace gas, or natural gas, has found application.

In this connection we have recently introduced what are known as our gas ovens and combination ovens. The combination oven has been adopted by a number of steel plants in Germany, the ovens being heated with blast furnace gas, all of the gas from the coal being used in the various departments of their steel plants. Among these applications is its use as open-hearth fuel. Germany has made more progress in this direction than this country, and has demonstrated clearly that coke oven gas is well adapted for this purpose. In some cases they use coke oven gas alone and in others they mix coke oven gas with blast furnace gas, both methods resulting in higher furnace temperatures, thus increasing the open-hearth output. It has been found that after the workmen become accustomed to the new fuel, the life of the furnace is as long with coke oven gas as with producer gas.

Among the advantages are the following:

1.—Higher furnace temperatures, resulting in greater output.

2.—More uniform combustion, resulting in greater fuel economy.

3.—Elimination of the gas chambers, resulting in cheaper furnace construction.

4.—Smaller repair costs.

5.—Cheaper operating cost.

Discussion

Mr. Hartman's paper aroused considerable interest and was discussed at length. The following was contributed by F. F. Marquard, superintendent of the coke department of the South Sharon plant of the Carnegie Steel Co.:

The statement made by Mr. Hartman regarding the rapid evolution of by-product coke oven construction is not in the least exaggerated. Ten years ago when the United Coke & Gas Co. built our plant of 212 Otto-Hoffman ovens at South Sharon, our ovens were the largest of the by-product type built up to that time. They are 42 feet long, 17½ feet wide and 7 feet high, taking a charge of 9.12 net tons of coal. The ovens were operated with considerable difficulty at first, and for a time it was feared the plant was a failure because of the excessive size and difficulty of heat control.

However, many details have been worked out which have put us on an efficient and profitable operating basis, and today instead of being too large to be efficient competitors in the Corporation coke-making, we are too small a unit. Joliet has exceeded us in size of oven and Gary has exceeded Joliet in about the same proportion. We are operating our ovens on a mixture of 65 per cent Klondike and 35 per cent Pocahontas coal, having an average of 25.5 per cent volatile matter. We have steadily maintained a coking time of 24 hours, but within the past month we have reduced the coking time to 20½ hours with very encouraging results in the action of the coke on the blast furnaces. Our blast furnaces, which are operating on all Sharon by-product coke, responded immediately by increased iron yield and smoother working. The coke is slightly larger, more porous and tougher.

Prejudice Dissipated

The prejudice which blast furnace men, accustomed to beehive coke, have had regarding by-product coke is rapidly being dissipated. However, not until they knew that there is as much difference in the qualities of by-product coke as there are differences in the quality of the coals from which the coke is produced did they begin to realize the possibilities of by-product coke.

It is folly to compare by-product coke made from an inferior coal with beehive coke made from the best Connellsville coal, but this very thing they have been doing time and again. The coke quality today is of prime importance. Thus the by-product coke of today, where it is made for metallurgical fuel, is far superior to the by-product coke made 10 years ago, because the coal for making this coke has been thoroughly studied, and the heating conditions are very much higher and uniform.

The oxygen in coal has a most deleterious effect on the quality of coke; for this reason coals which have been subjected to weathering, such as coal carried on stock piles, even for as short a period as four or five weeks, have a pronounced effect upon both the quality of the gas and coke produced. The shorter the interval of time from the mines to the ovens, the better the coking results will be.

In the reduction of our coking time from 24 to 20½ hours I have observed that we got a quality of coke which enabled the blast furnaces to work more rapidly and more smoothly. However, it had a tendency to increase the amount of coke used per ton of iron produced. This, however, on so small a period of time is not conclusive evidence.

I also found that our tar yield was reduced from 7 gallons per net ton of coal to 5¾ gallons, and we had an increased amount of naphthalene to contend with.

Our ammonia yield decreased from 4.75 pounds NH_3 per net ton of coal, to 4.4 pounds. Our surplus gas yield increased from 3,000 cubic feet per net ton of coal to 4,600 cubic feet. Our total gas was about the same, 12,000 cubic feet per net ton.

Thus it showed that it took no more gas per hour to heat the ovens on a 20½-hour coking time than it took on a 24-hour coking time. However, the higher heated walls enabled us to burn this quantity of gas more efficiently in the oven flues, rather than allow same to be carried down to the regenerator below.

I believe our yields of tar, ammonia and gas will be proportionately affected as the coking time is reduced still further, so that a time will doubtless be reached when the heat necessary to produce a shorter coking time will effect, on the whole, a loss rather than a gain when all factors are accounted for.

The result of our practice shows that we get a yield of 76 per cent of dry furnace coke and 3 per cent dry breeze from a coal mixture having 25.5 per cent volatile matter, which shows that 4.5 per cent of the volatile matter driven off in the laboratory test is converted into coke in the by-product oven, while, on the other hand, in the beehive ovens, the coke yield is 3 to 6 per cent less than the results as shown by laboratory analyses of the coals carbonized. This effects a saving in the coke yield from by-product ovens of from 7 to 10 per cent more than the coke yield from beehive ovens coking from the same coal.

By Richard Moldenke

Mr. Hartman's paper is naturally written with an idea of emphasizing the possibilities of commercial economy. Hence it appeals more particularly to the blast furnace man. The foundryman will take exception to some of the statements. "Shortening the coking time increases the porosity of the coke" is undoubtedly correct, "without decreasing its crushing strength" is open for discussion, as quite the opposite has been observed. Increasing the porosity of the coke is what the furnaceman wants as he wishes to make all the gas he can. The foundryman, on the other hand, wants to get a coke with a minimum of cell-space, as he wishes to produce complete combustion. Hence the foundry trade, with an annual consumption of possibly a million and a quarter tons of coke, will not welcome a reduction in the cok-

ing time either in the by-product or the beehive oven.

Mr. Hartman is perfectly right in attributing this possibility of getting a greater percentage of cell structure to the higher temperatures now attainable in by-product ovens. The same condition is observed in the beehive oven, where the admission of more or less draft through the door hastens or retards the cell-making of the coke produced. It is a well-known fact that the cell structure of a coke is attained in the first 24 hours in the beehive oven.

Mr. Hartman is in error when he states it as generally believed that the Steel Corporation's experience with low volatile coals indicated that the best cokes were made that way. Quite the contrary, for it was generally believed that much of the trouble known to exist at the Joliet plant was due to the comparatively low volatile coals used. Mr. Hartman admits this practically, in stating that better results were obtained with the volatile at 25 per cent.

As a matter of fact every by-product plant has its own experience and consequent standard for volatile. One plant I know of holds to 29 per cent, while another wants 25 per cent, and still another, 30 per cent. One great advantage of the by-product system, due to the localities so far selected for business reasons, is the ability to mix the coals. In this way ideal coke conditions are obtainable, as a variety of coal markets can usually be drawn upon. At the beehive plants, this is impossible. They serve only the coal mines of the region. Mr. Hartman's paper is replete with interesting data, and particularly his comparison of cost per oven when taken ton for ton as between by-product and beehive; these costs being identical, should help persuade those who contemplate adding to their coke oven capacity to stop a great waste of fuel value.

By J. L. Haehnlen

At the present stage of the industry, there are, in my opinion, two phases of the question, which call for more thorough and conscientious investigation than has yet been attempted. First, we must get more exact knowledge of the thermal conditions existing in the coking mass itself, at all points, during the complete cycle of coking. Some tests have been made along this line but they are very incomplete. Then, secondly, we need further investigation of the physical properties of the refractory materials entering into the construction of oven walls, etc. Splendid work has been done along this line by Wologdine, Dewey, Clements, Egy, Ray, Kreisinger and several others, some of whose reports have not been published, but more work remains to be done, especially with the materials with which we have to work. We do not know all we should about the flow of heat through oven walls, and upon these two phases, so closely allied, depends the further reduction of coking time as touched upon by Mr. Hartman.

Considering the industry as a whole in the broadest light and from the viewpoint of the iron manufacturer, who naturally compares the cost of installation of the plant with the value of the product, as for example in the case of the blast furnace, the first cost of the by-product oven is excessively high. It is, therefore, to be hoped that in the not far distant future a simple type of oven, not necessarily along the present lines, but of greater productive capacity and less cost, will be brought forward.

By W. O. White

Concerning the return on the investment required for an up-to-date by-product coke plant erected in connection with a large steel plant there is of course no question. Viewing the situation from the standpoint of the individual or corporation which intends to operate a large tract of coking coal as a coke operation pure and simple, then the question which presents itself to me is this: Will the return on the investment warrant by-product coke oven construction?

My opinion is that the smoke which now goes to waste and denudes the country surrounding our coke regions of vegetation can be more profitably used in a regenerative type of coke oven than in a by-product oven. A plant constructed along this line would be one in which the coking period would be greatly shortened while also there would be a very considerable excess of heat which can in many localities be converted into electrical power at a comparatively small additional cost of investment.

Mr. Hartman's contribution to the literature of by-product coke ovens and by-product practice is interesting and valuable. As a general proposition the doctrine he subscribes is one which I have been preaching for the last 15 years.

As Mr. Hartman justly states, the development of the by-product or retort method of coke making in the United States has been retarded, first by the high cost of installation and second by the apprehension on the part of the by-product oven people themselves that the markets for the by-products, with the exception of gas, would be demoralized. This was principally feared in regard to tar.

The prejudice against by-product coke, which was much in evidence 12 or 15 years ago, is disappearing. Iron masters accustomed to the beautiful silver luster of Connellsville coke concluded that any other coke not having such luster was of inferior quality, and it was immediately condemned. There was no thought of making a change in the blast furnace charge or other conditions to meet the new field, and if the by-product coke did not behave exactly the same way in the furnace as Connellsville coke the wisdom of the condemnation was proved. The best answer to this proposition is to cite the record at Johnstown. The first plant of Otto-Hoffman ovens was erected by the then Cambria Iron Co. in November, 1895. This was of 60 ovens, and the second installation of 100 ovens was completed in March, 1899; the third, also of 100 ovens, was completed in September, 1904, and the fourth, of 112 ovens, was completed in 1907. An organization controlled by such men as those of the Cambria Steel Co. would not have made these different installations if by-product coke had not been found satisfactory in its own furnaces and if the operations had not been profitable, cost of installation, maintenance, and everything else considered.

The first plant of Semet-Solvay ovens, at Syracuse, N. Y., which was the first bank of by-product ovens to be constructed in the United States, has been twice enlarged. Another instance I might cite is the installation of Koppers ovens at Las Esperanzas, Mexico. These are waste-heating and not by-product recovery ovens, but with the exception of the by-product recovery the principle is the same. The company secures from 50 ovens practically all the tar necessary for the operation of its plant. It has increased its yield of coal and coke from 15 to 16 per cent, and 48-hour coke is made in from 18 to 20 hours. A better price is obtained for the retort oven coke than was obtained for the beehive product formerly made. The increase in size of batteries cited by Mr. Hartman is interesting and records another instance of the tendency in modern industrial enterprises to large units.

By J. R. Campbell

I have followed the paper by Mr. Hartman closely and the remarks therein agree with my own impres-

sions of the by-product industry. He pays quite a compliment to the coke committee of the United States Steel Corporation, headed by Messrs. Meissner and Forbes, which, in my opinion, is well deserved. This body of men decided wisely in general in adopting the by-product process and, in particular, the H. Koppers direct process for recovery of N H₃.

By Dr. F. Schniewind

Mr. Hartman states that the progressive action of the United States Steel Corporation marks the beginning of the real growth of the by-product coke oven business in this country and that the Steel Corporation's coke committee adopted the Koppers ovens after an investigation of the different types of by-product coke ovens in Europe.

This is not correct, as the coke committee of the Steel Corporation made a thorough study of only one type of oven, and did not investigate the modern examples of other types of ovens at all; therefore, their conclusion can hardly be conclusive.

Nevertheless, the Steel Corporation's coke committee rendered a great service to the by-product coke oven industry by erecting for the first time a by-product coke oven plant without regard to expense. The great difference in cost between bee-hive ovens and by-product ovens has been the great handicap against the introduction of by-product coke ovens in this country. Everybody was afraid of such a large investment until the Steel Corporation proved that if anything, the money spent on these ovens up to the time of the erection of the Joliet plant was too small.

The credit for the initiative and progressive foresight looking to the vast economies and possibilities in connection with by-product coke ovens belongs to the officials of the Cambria Steel Co. of about 15 years ago—Powell Stackhouse, C. S. Price and Joseph Morgan.

Mr. Hartman suggests that the quality of coke from by-product coke ovens erected in this country was not altogether satisfactory. This is misleading as at the time by-product coke ovens were first introduced into this country there existed prejudices in regard to the quality of coke on the part of the blast furnace men. The ideas of blast furnace superintendents in regard to the quality of coke required have undergone material changes, however, and I only point out here what Mr. Hartman also states, that the coke is now being broken before it is charged into the furnace.

It was proved long ago that the high volatile coals which made an excellent coke in American bee-hive ovens would not produce a coke in by-product coke ovens which would meet the specifications given by the average American blast furnace superintendent. In order to prove whether the objections against the by-product coke are well founded, about 3,000 tons of coal were coked in United-Otto by-product coke ovens in 1898 and were tested in a blast furnace under the supervision of John Fulton and E. A. Uehling. The test proved that per ton of pig iron about 100 pounds less by-product coke was used than bee-hive coke and that the capacity of the furnace materially increased.

It would take us too far to discuss at present the various heating systems of coke ovens, but with very much simpler means other types of ovens obtain even a greater uniformity of heating than the type described by the author. This is confirmed by the results at plants in operation. If the short coking time were actually a standard of uniformity of heating I could point out that batteries have operated in 14 hours, not for a day but for months. This naturally greatly increases the daily capacity of a plant; but that it will also decrease the cost per ton of coke to a minimum Mr. Hartman will still have to prove. The destruction of by-product is enormous when the temperature of the ovens is carried above a certain point, and therefore the craze for big capacities may not always be conducive to highest economy.

Use of First Silica Lining

The first silica material was used about 14 years ago in connection with by-product coke ovens installed by the Cambria Steel Co., at Johnstown, Pa. In our construction for the last 10 years the ovens proper have been exclusively built of silica brick.

The first movement for increasing the size of ovens was made in 1902 when several plants with ovens 42 feet 8 inches in length were built. These held a coal charge of over nine tons against six or seven tons before that time. There are a number of companies which are now building ovens of a 15-ton coal charge.

The market for by-products resulting from the use of by-product coke ovens has been very rapidly developed within the past few years, particularly for tar products, and its use for the generation of power will play a very important part within the next few years.

The enormous demands made, which are annually increasing, for high class fertilizers point conclusively to the fact that the market for sulphate of ammonia will share in the upward tendency. The farmers are getting to more fully appreciate the great value of fertilizers blended with sulphate of ammonia. In fact there need not be any fear that the demand for all of the products, namely, tar, ammonia and gas, will be, under normal conditions, quite equal to the supply.

Features of By-Product Ovens

There are many features in connection with the by-product coke ovens which might be greatly enlarged upon if time permitted. The subjects worthy of larger scope of presentation are:

The development and advantages of silica bricks.

The especial importance of the tightness of the ovens where the manufacture of illuminating gas is involved. Incident to this feature is the necessity for the grinding of bricks used in the oven wall construction.

The development of heavy oven walls was made apparent many years ago in connection with the construction of the ovens for the Cambria Steel Co., brought about by the requirements for the treatment of the low volatile coal of a swelling nature which is used by them.

A recognition of the damands for reduced operating expenses evolved from a larger output capacity was apparent about 12 years ago. This led to the installation of several plants under the United-Otto system of ovens about 43 feet long with a charging capacity of about nine tons and a coking time of about 20 hours.

Several hundred chrome-vanadium steel tires are now being tested in service and the records so far obtainable indicate that practically double the mileage of ordinary carbon steel tires can be obtained. The wear has been found to be more uniform and the flange wear is much less than that of carbon steel tires. The recent report of a locomotive equipped with chrome-vanadium steel tires shows a mileage of 140,000 and the tires have only been turned once.

A Virginia railway, whose locomotive equipment includes some of the heaviest and most powerful machines in the world, has nearly 200 vanadium steel tires in service and these have been specified on the additional locomotives recently ordered.

Hawley Down Draft Furnace Co.'s New Plant

Arrangement and Construction of These Works Which Include Gray Iron and Brass Foundries, Machine, Assembling and Pattern Shops

The new plant of the Hawley Down Draft Furnace Co., Easton, Pa., the erection of which was commenced about a year ago, has been completed and has been in operation for several months. The works are located on the outskirts of Easton and shipping facilities are provided by a spur from the main line of the Lehigh Valley railroad, while three other roads, the Pennsylvania, New Jersey Central and Delaware & Hudson, are readily accessible.

The plant comprises gray iron and brass foundries, pattern, machine and assembling shops, pattern storage, tool and supply room and a shipping and receiving yard. The buildings are all of reinforced concrete construction, with steel roofs of the monitor type; the lighting facilities are adequate, windows in the side walls and monitors, and a general distribution of inverted arc lamps, provide both natural and artificial illumination. The company plans to erect a steel foundry, 150 x 250 feet, work on which is to be commenced shortly.

The products manufactured by the Hawley company consist of heating, melting, refining and reducing furnaces, ladle heaters, coke fired crucible metal melting furnaces, etc. These are assembled in the plant, the plates and shapes being ordered according to specifications, and the castings are produced in the foundry. Later the company plans to do all the fabricating of plates and shapes in its own shops.

FIG. 2—THE FOUNDRY, SHOWING TWO OF THE MELTING FURNACES

All castings are produced from metal melted in Hawley-Schwartz furnaces. The foundry, at present, is equipped with only one No. 3 furnace of this type. Until a few weeks ago it contained three furnaces, but two of these were shipped to fill rush orders. They will be replaced as soon as possible with furnaces of large capacity. The No. 3 furnace has a capacity for melting one ton of iron per hour. While these furnaces may be fired with gas, the fuel employed at Easton is oil, this being stored in an underground tank having capacity of 15,000 gallons. From this tank the oil is delivered to the furnaces by means of an air pump. It enters the furnace through two tuyeres which are perpendicular to the furnace shell and which are at an angle of approximately 60 degrees to each other. The blast, which is furnished by a Connersville blower at a pressure of 1½ pounds per square inch, also enters the tuyeres and drives the oil, in the form of a spray, into the interior of the furnace. This oil is consumed at the rate of about 50 to 60 gallons per ton of cast iron and 65 to 70 gallons per ton of steel. The furnace is spherical in shape. The outer shell is made of steel plate, while the spout and top door are of cast iron. The shell is made in two parts to facilitate relining. The lining is made of specially-shaped refractory brick which ranges from 5 to 12 inches in thickness; in the No. 3 furnace it is 9 inches thick. These linings have an average life of about 600 heats. The furnace is supported on either side by cast iron housings which

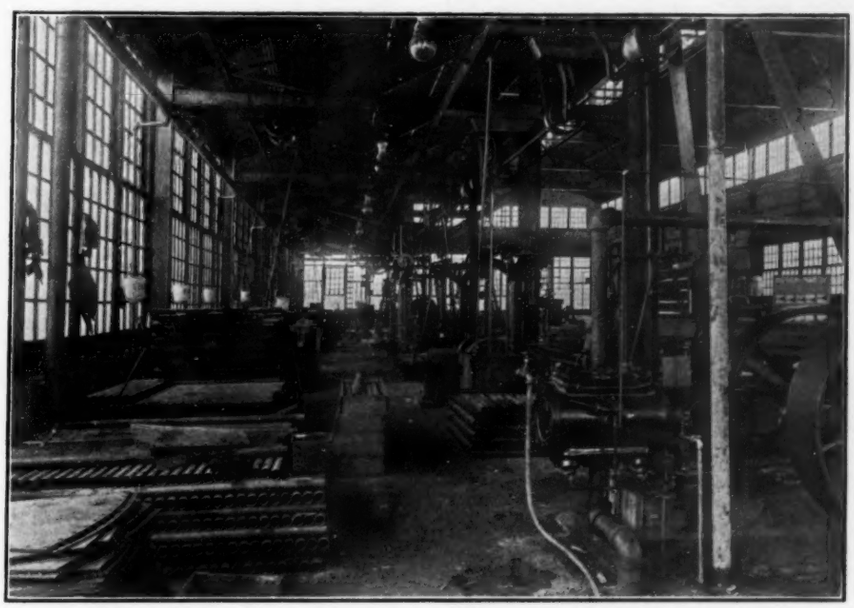


FIG. 1—A VIEW OF ONE SECTION OF THE HAWLEY DOWN DRAFT FURNACE CO.'S MACHINE SHOP

are securely bolted to concrete foundations. The tilting mechanism is controlled by a hand wheel. The furnace charge consists of pig iron and scrap. After this is reduced to a molten condition, the furnace is tilted back to slag-off. After the slag is removed, the furnace is tilted forward, the metal being tapped from the spout into bull and hand ladles.

An interesting feature of the foundry equipment in the core oven, especially designed by C. M. Bleyer, general manager of the plant. This oven is built of concrete and is partitioned off into two compartments. The doors are steel plates which are fastened to the front end of each car so that when the cars are pushed along the rails into the oven, the latter is automatically sealed. The cars are provided with racks of sufficient capacity for one day's output. An asbestos sheet is attached to the outer side of each car and when the car is pushed into the oven an oil flame, is directed against this sheet from a nozzle embedded in the wall.

The foundry is a 60 x 200-foot structure, the floor being commanded by an overhead traveling crane operated by hand. The shop contains four molding benches and 10 floors. It also contains a small brass melting furnace which has a capacity of 500 pounds per hour. The air is delivered to this furnace at a pressure of 12 ounces.

In the foundry are produced boiler fronts, doors and stands, gears, ladle heater castings and other parts which are used in the manufacture of the Hawley company's products. These are tumbled, chipped and cleaned in one end of the foundry, after which they are transported to the machine and assembling department on an industrial railroad.

The cleaning department is located in a 175 x 250-foot building which is commanded by a 5-ton overhead traveling crane. At one end of the building is the heating plant, which consists of a 65-horsepower return tubular boiler and down draft furnace. Adjacent to the heating plant is the forge department. This contains a coke forge 5 feet wide and 2 feet long and is shaped similar to a trough. At the bottom is a blast pipe with holes in the tops drilled 3 inches center to center, through which air is blown by a No. 2 Sturtevant fan. Into this trough coke is piled and ignited, after which the blast is turned on. This forge is employed especially for heating 10-inch black pipe which is flattened on two sides for use as water drums in the down draft furnaces. In addition to being flattened, these pipes are fitted at either end with 10-inch plugs which are drilled for pipe connections. After the forging process is completed, the drums are subjected to an hydraulic test.

The equipment of the machine shop includes four heavy duty drill presses; three pipe cutting and threading machines for the preparation of boiler flues; two emery wheel stands, two shapers, one 44-inch swing engine lathe, one 24-inch swing lathe, one wet grinder, one 40-inch swing engine lathe, one 16-inch swing lathe, one 20-inch swing lathe, one 1-ton portable floor crane, one belt-operated air compressor and a steam engine for operation in case of emergency. The electric current is purchased from a local power company, the various groups of tools being operated from line shafting driven by separate motors.

Each machine operator is provided with a portable tool table which has three sheet steel shelves and a table for tools, machine screws, gear wheels, etc. The machine room also contains racks for the storage of castings, both finished and unfinished, and for the storage of pipe for boiler flues and drums.

After the furnaces are assembled, they are delivered by a traveling crane to a loading platform near the end of the machine shop, through which the railroad spur enters and all products thus may be loaded conveniently under cover for shipment.

The tool and supply room adjoins the machine shop. The pattern shop is located in a well-lighted frame structure which is partitioned off at one end to provide storage space for the patterns and pattern lumber. The pattern shop equipment is operated by a 5-horsepower motor.

The shipping and receiving yard is provided with storage sheds for the various refractory shapes used in the melting furnaces. Separate sheds are used for the storage of materials used in making refractory mixtures. The officers of the company are C. E. Bleyer, president; Cliff M. Bleyer, general manager, and John J. Ryan, superintendent.

Reviews of New Catalogs

TRANSFORMERS. — The Westinghouse Electric & Mfg. Co., East Pittsburgh, has issued a leaflet descriptive of its outdoor transformers. These are of the oil-immersed, self-cooling type.

INDUSTRIAL RAILWAYS.—In an 89-page catalog, issued by the C. W. Hunt Co., New York City, industrial, narrow gage railways for handling raw and finished material in foundries, iron and steel mills, power plants, etc., are illustrated and described.

FUEL ECONOMIZERS.—The Green Fuel Economizer Co., Matteawan, N. Y., has sent to the trade a handsomely illustrated catalog devoted to fuel economizers. The subject of waste heat is given attention as well as the merits of the company's fuel economizer.

HEATING BOILERS.—In a 32-page catalog issued by the Illinois Malleable Iron Co., its extensive line of boilers for steam and hot water is illustrated and described. Numerous specialties also are shown, including a combination fitting for single pipe hot water work.

TRANSFORMERS.—The Crocker-Wheeler Co., Ampere, N. J., in a recently issued bulletin, describes and illustrates its line of Remek lighting transformers. The method of assembling this transformer, for which mechanical, magnetic, and electrical advantages are claimed, is shown pictorially by a series of views.

TRUCKS AND CARS.—In a well-arranged and well-illustrated, 160-page catalog, the Chase Foundry & Mfg. Co., Columbus, O., describes its extensive line of trucks and cars, switches, turntables, steel ties, portable track and all kinds of industrial railway equipment. The cars and trucks shown are designed for use in all kinds of manufacturing plants, including foundries, rolling mills, machine shops, etc. Roller bearing core oven cars are made in various styles and sizes, as well as coal and coke charging cars, dumping buckets, etc.

CABLEWAYS.—Cableways for lock and dam work are described in the latest bulletin of the Lidgerwood Mfg. Co., 96 Liberty street, New York. The most important features of the book are the illustrations and descriptions of the company's newest form of cableway, designed to meet the requirements of the Isthmian canal engineers. Illustrations showing a number of the most important engineering works of the world are shown in the bulletin.

PNEUMATIC DRILLS.—In a 16-page bulletin, the Ingersoll-Rand Co., 11 Broadway, New York, illustrates and describes "Little David" pneumatic drills, which are adapted for all the ordinary work of a pneumatic drill such as reaming, tapping, drilling, flue rolling and wood boring. The motor or engine is of the angular, four-cylinder, single-acting, reciprocating type, each pair of pistons being attached to opposite throws of a double crank shaft. The machines are built reversible, but can be made non-reversible. The valve action is such that there is no compression of exhaust.

MILLING CUTTERS.—A 112-page catalog devoted to milling cutters has been issued by the Becker Milling Machine Co., Hyde Park, Mass. The cutters listed embrace the entire line of standard milling cutters, as well as a special line of cutters and collets that are made for vertical milling machines, die sinking and profiling machines. In this catalog both the carbon and high speed steel cutter lists are combined, which greatly facilitate a comparison of prices when selecting cutters. The catalog is well illustrated and contains a large number of useful tables.

SHOWS INCREASE

Foreign Ore Receipts For First Half This Year Are Heavy.

Philadelphia, Aug. 13.—Foreign iron ore receipts at eastern ports during the first half of the present year were considerably in excess of the same period in 1911 but were considerably below the movement in the record year of 1910. During the first half of the year the total imports of ore from foreign countries were 994,371 tons, compared with 801,868 tons in the corresponding period in 1911 and 1,259,266 tons in 1910.

Trans-Atlantic shipments of foreign ore this year are scarcely up to the record of other years, this being due principally to the reduced tonnage of Spanish ore that is coming in. In recent years, Spanish ore has been freely used by eastern blast furnaces, although the imports of this class last year were considerably less than in 1910. Comparatively little if any tonnage of the higher grade Grecian and African ores are now being received. Swedish ore, however, will probably establish a new high record during the current year.

The most important external source of ore supply for this country, that of Cuba, continues to hold the leadership in shipments and these deposits apparently are increasing in importance as a base of merchant material for eastern furnaces. Development work of Cuban deposits is being prosecuted vigorously in both the Mayari or north coast and the Diaquiri or south coast districts and more of this ore has been absorbed by merchant iron makers in the east this year than at any time since these deposits were opened. In all, sales exceeding 200,000 tons of this ore have been made for this year's delivery to eastern furnaces. Imports of Canadian ores to the eastern district this year are about up to normal proportions. The Venezuelan deposits have not yet been developed to the point that makes them an important commercial factor in the east, but the companies interested in these properties announce that they will be able to ship freely next year.

Interested in Bridge.—President Chas. M. Schwab, of the Bethlehem Steel Co., and other prominent citizens of Bethlehem and South Bethlehem, are actively interesting themselves in the project to erect a steel bridge across the Lehigh river and connect the two towns and also of the building of a large union station. The cost of the proposed bridge is estimated at $525,000.

PIG IRON COSTS

Near Recent Selling Price—The Agreement as to Ore Tax.

During the recent discussion between representatives of iron mining companies and Ohio tax officials of Cleveland, R. F. Grant, counsel for M. A. Hanna & Co., presented the following statement as to the cost of making a ton of pig iron in the valley:

Two tons iron ore	$2.75	$5.50
Freight to valley	.56	1.12
One and one-fifth tons coke	2.25	2.70
Freight from Connellsville	1.35	1.62
Half ton limestone	.65	.325
Freight on limestone	.35	.175
Cost of raw material		$11.44
Conversion cost at furnace		2.00
Cost of one ton of pig iron		$13.44

With basic, foundry and malleable irons selling as low as $13.25, as they have recently, the selling price was less than the cost as given by Mr. Grant. There is an average of 600,000 tons of ore on dock upon which the mining companies were willing to pay an assessed value of $2 per ton, which would be equivalent to 20 cents per ton on the 6,000,000 tons which the docks usually hold in April. The mining people contend, however, that a very large percentage of this ore on dock, April 1, is in transit and is not taxable. Hence, the mining representatives say that in getting 40 cents, as agreed upon, the tax officials have obtained more for the tax duplicate than they had a right to expect.

Furnace Dividend Suspended

Announcement is made of the suspension of dividends by the Thomas Iron Co., Hockendauqua, Pa. The directors state the step is taken as a precautionary measure in view of the long-continued depression that has existed in the pig iron market. The Thomas Iron Co. has consistently followed very firm price policies, preferring to blow out its furnaces rather than to accept profitless business. Its operations were reduced to a single stack, but recently, with the revival of activity in the market, it has been booking orders more freely and has increased its activities by the blowing in of additional stacks at Alburtis and Hellertown.

HIGHEST POINT

Since Panic of 1907 Reached by Corporation Orders.

Booked orders of the United States Steel Corporation on July 31 were at the highest point of business on hand at any time since the panic and depression of 1907. The announcement made Aug. 10 shows that the unfilled orders on the books at the end of July were 5,957,079 tons, an increase of 149,733 tons over the mark at the end of the previous month, which was 5,807,346 tons. The highest previous tonnage statement since the break of the steel trade in 1907 was at the close of the quarter ended Dec. 31, 1909, when 5,927,031 tons were on hand. The bookings at the present time are the heaviest since the quarter ended Sept. 30, 1907, when they stood at 6,425,008 tons.

The increase of 149,733 tons of new orders over the shipments in July is about what had been predicted. This result indicates the very substantial condition of trade that still prevails with the leading steel maker, for, while the showing was contributed to by a moderate decline in production and shipments last month, it is known that new business in July came in very freely considering the season. Furthermore the new bookings in August thus far have been in excess of those of July.

Since the plan of making monthly statements of unfilled tonnage has been followed by the Corporation, the statements of business on hand, the tonnage and percentages of increase or decline from the previous month, have been as follows:

Date.	Total.	Change, tonnage.	Change, per cent.
July 31, 1912	5,957,079	149,773+	2.58+
June 30, 1912	5,807,346	56,363+	0.98+
May 31, 1912	5,750,983	86,983+	1.52+
Apr. 30, 1912	5,664,885	360,044+	6.97+
Mar. 31, 1912	5,304,841	149,359—	2.79—
Feb. 29, 1912	5,454,200	74,479+	1.38+
Jan. 31, 1912	5,379,721	294,960+	5.71+
Dec. 31, 1911	5,084,761	942,806+	23.24+
Nov. 30, 1911	4,141,955	447,627+	12.06+
Oct. 31, 1911	3,694,328	83,011+	2.25+
Sept. 30, 1911	3,611,317	84,668—	2.34—
Aug. 31, 1911	3,695,985	111,903+	3.33+
July 31, 1911	3,584,085	223,027+	7.16+
June 30, 1911	3,361,058	247,871+	7.96+
May 31, 1911	3,113,187	105,617—	3.28—
Apr. 30, 1911	3,218,704	228,597—	6.63—
Mar. 31, 1911	3,447,301	46,758+	1.37+
Feb. 28, 1911	3,400,543	289,624+	9.31+
Jan. 31, 1911	3,110,919	436,162+	16.30+
Dec. 31, 1910	2,674,757	85,656—	3.09—
Nov. 30, 1910	2,760,413	111,536—	3.88—
Oct. 31, 1910	2,871,949	286,157—	9.12—
Sept. 30, 1910	3,159,106	379,088—	10.74—
Aug. 31, 1910	3,537,128	433,803—	10.92—
July 31, 1910	3,910,931	286,863—	6.72—
June 30, 1910	4,257,794	.....	.....

The Reading Iron Co., Reading, Pa., is replacing its small repair shop, connected with one of the rolling mills, with a brick structure. A small traveling crane, already ordered was the only new equipment required.

THE IRON TRADE REVIEW

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The Advances in the Iron and Steel Market

The upward movement in iron and steel prices has now reached a stage when a summary of what has occurred becomes of value. The movement has lasted long enough, with successive advances, instead of single advances, in most of the products to indicate what the movement means and what it is worth.

First, it should be observed that as to finished steel prices the advance since the great low point of last November has not been continuous. Prices advanced in rather a marked way in December, and slightly also in January, but in February they declined again, marking another low point, though one not altogether as low, on an average, as that in November, particularly as to the most important of the regular mill products. Certain specialties, however, like shafting and railroad spikes, reached a slightly lower level in February than in November. About the middle of March, steel prices began to firm up, and from that time to the present the advance has been continuous, with no retrogressions, though with an acceleration of the pace in the past six weeks. This last feature is worthy of notice, by the way, for the period has been one in which the markets are normally dull.

Pig iron, in contrast with finished steel, did not find its low point in November. While various markets fluctuated in November and December, the low point was rather about the beginning of this year. While steel had two low points, November and February, pig iron had only one, and it fell intermediate of the others.

The February low point in bars, plates and shapes was 1.10c, the present market being 1.30c on bars and 1.35c on plates and shapes, advances of $4 a ton in bars and $5 a ton in shapes and plates.

The whole category of tubular goods, including merchant pipe, line pipe, oil country goods and boiler tubes, has advanced approximately $4 a ton, the advance being quite comparable to that in bars, plates and shapes. To be included also in this category are sheets and tin plates.

The various products mentioned comprise about two-thirds of the total output of finished steel in the country, the remaining third being made up chiefly of standard rails, which have not varied in price, light rails, which have advanced moderately, wire products, which advanced $1 a ton in January, before the February low average level was reached, and $1 a ton on July 22.

Inasmuch as standard rails have not changed in price for 11 years, but lately have been experiencing, according to the claims of the mills, such an improvement in quality as to be equivalent to an advance in the flat price, they may be excluded from the reckoning, and it may be said that finished steel products, outside of standard section rails, have, in the general average, advanced slightly less than $4 a net ton, or slightly more than $4 a gross ton, from the February low point. This advance has occurred in slightly more than four months, but half of it has occurred in the recent period, which constitutes much less than half of the total four months.

While complaint has frequently been made of late that pig iron has not participated to any extent in the advance, finished steel having advanced very much more than pig iron, at least than northern pig iron, it should be pointed out that in the past it has not been customary for pig iron to advance as much as finished steel, with the single exception, perhaps, of periods of great pressure for deliveries of all material, like that in 1906-7, when the steel makers held down prices of finished steel by main force, and pig iron, presenting a strictly open market, advanced *ad libitum*. The exception, indeed, is a good test of the rule, for it is supposed that there is now an open market both in pig iron and in finished steel.

Pig iron, however, really has advanced by a moderate amount. Most descriptions of northern iron are up from 50 cents to $1 a ton from the level at the beginning of the year, and a fair average would probably be about 75 cents. Southern iron, which was openly quoted at $9.75, Birmingham, at the beginning of the year, is up $2.25 on a large part of the tonnage sold, and averaging southern and northern, giving northern its appropriate weight, the whole advance in pig iron may be regarded as a trifle more than $1 a ton, between one-third and one-fourth as much as the advance in steel products.

The southern iron market, of course, being almost wholly one of foundry grades of iron, can hardly be counted as making up any part of an advance which is to be contrasted with the advance in steel products,

since in the case of northern iron a very considerable portion of the tonnage is steel making iron. This, however, brings one to the point that the merchant pig iron output of the north does not run nearly so much to steel-making iron as it did at one time. Since 1909, when the large steel works bought so heavily of merchant steel-making iron, and the smaller works, of course, bought more than usual, the large steel works have come to be more self-contained. This fact goes to account very largely for the fact so much commented upon in the past few months, that while the blast furnaces of the steel works have been running almost to capacity, the merchant blast furnaces have not been very active, not more than 60 per cent of the rated capacity having been in operation during the past six months. As a rule, the merchant furnaces are able to make steel-making iron or foundry grades as occasion requires, and merchant furnaces thrown idle through a decline in the demand for steel-making iron are naturally in the position of a barrier to an advance in the price of any description of iron. Very recent developments, however, indicate a movement in northern pig iron which will place it more nearly in line with finished steel, if indeed finished steel does not meanwhile experience further important advances.

Dual Responsibility for Wrecks

Inferior quality of steel has been ascribed so frequently as the cause for broken rails and consequent wrecks on the railroads in recent years that the railmakers have been forced to take almost a defensive position in this discussion which has held so much space in the public press, especially during the past winter, when breakages were unusually severe.

Railroad managers have not been at all backward in advancing this theory to explain the occurrences of wrecks upon their lines. Their position in this regard has been met by steelmakers with the claim that the increased density of traffic and the much heavier equipment used are crowding the life of the hitherto adequate section, making necessary more frequent renewals, a course which the railroad managers are not always willing to follow. The question is now undergoing an exhaustive study by a joint committee of rail makers and railroad executives, but no recommendations have yet been reached.

An illuminating case which, no doubt, is suggestive of much parallel in the conditions prevailing among many railroads, has arisen in the report of the Public Service Commission of New York State of its investigation into the wreck of the Twentieth Century Limited train of the New York Central lines at Hyde Park, New York, March 13, 1912. This report establishes the fact that the broken rail which threw the train was not the cause of the wreck, but was a result of the disaster. The direct responsibility for the wreck is laid to a low spot in the track bed which considerably reduced the elevation of the outer rail below the limits of safety at a certain point and caused the locomotive to lurch heavily against the rail with disastrous results.

The commission's report emphasizes what has already been repeatedly stated in the present agitation for greater safety in travel, that weather conditions play a large part in railroad accidents and that, obviously, winter, when track beds are most likely to be in the poorest shape, is the season most productive of wrecks.

It is apparent in this problem of railroad wrecks that however great is the responsibility resting upon the railmakers for maintaining a proper degree of resistance in the rail metal, there is an equal, if not more important, duty imposed upon the railroad managers also for the upkeep of sound conditions under the rail. Track construction must be considered as a unit and no component part can be lacking in constant strength, if the ends of safety are to be fully served. Good rails and poor road beds are just as deadly as poor rails and good road beds.

Lending a Helping Hand

So pronounced has been the scarcity of common labor among the iron and steel plants of the country that various expedients are being resorted to by works managers to recruit their forces up to the point justified by prevailing business conditions. This scarcity of men has not been sectional, but has applied freely to all iron and steel producing districts. Outputs have been curtailed as a result of this stringency and in the east particularly a number of the plants have been unable to get sufficient men to command full capacity operations. Some blast furnaces there, which have been in shape to become active in the near future, are being delayed in resuming both directly by the lack of sufficient men to operate them and indirectly through the curtailed activities of the steel works and finishing mills.

Probably there has been no more interesting action taken to relieve the present situation than that which some eastern steel mills have adopted. These companies have been scouring the so-called "down and out" missions of Philadelphia and through the directors of these refuge places, are extending the helping hand to those who through self-indulgence or misfortune, usually the former, have fallen low in the social scale. No less than 300 or 400 men have been drawn from these missions to the plants of the Lukens Iron & Steel Co., the Bethlehem Steel Co., and others. It is not an unfamiliar sight in Philadelphia to see the minister in charge of these missions taking a group of these men to the mill towns to begin life anew. Here they are being furnished with fairly remunerative work, promises of steady employment and surroundings conducive to clean living.

Included in these bands are skilled mechanics and men of varied experiences who have lost their grip upon themselves through loose habits and evil associations. Some of them welcome the chance to get away from the cities and to make a fresh start in the smaller mill towns, where they have neither friends nor boon companions.

The moral influence extended toward these men to pick up their careers anew and to follow honest and respectable occupations is made the more potent through the fact that here and there are employes occupying responsible positions in the mills, who at one time were members of this "down and out" class and hence are now offering the sympathies of fellow-experience.

There are some who will probably view the employment of men of such character as an experiment doubtful in its results, but it is nevertheless a refreshing circumstance that enables the iron and steel industry to offer the opportunities to such a class to follow honest and useful ways of living.

MEN OF THE IRON TRADE

Robert H. Ford has been appointed engineer of track elevation of the Chicago, Rock Island & Pacific railway.

Dwight E. Woodbridge, Duluth, Minn., has returned from Cuba, where he has been inspecting iron ore deposits.

P. Blum, Rockford, Mich., has purchased the business of the Western Iron & Metal Co., Detroit, and will conduct it.

Judge E. H. Gary has left Paris for Carlsbad, where he will stay two or three weeks before going on an extended motor tour.

Arthur H. Carpenter, of Denver, has accepted a position on the chemical staff of the American Vanadium Co., Pittsburgh.

William Anderson has been made assistant professor of mechanical engineering at the Michigan College of Mines, Houghton, Mich.

H. L. Caldwell and E. V. Nelson have organized the Caldwell & Nelson Engineering Co., consulting engineer, at Jacksonville, Ill.

J. D. Young has been appointed master mechanic of the Omaha division of the Missouri Pacific, with headquarters at Falls City, Neb.

C. D. Brackenridge, of the Rochester & Pittsburgh Coal & Iron Co., has returned from a two months' business trip and vacation in Europe.

C. T. Johnson, general manager of sales of the Republic Iron & Steel Co., Youngstown, O., has returned from a six weeks' trip to Europe.

J. A. Claussen, manager of the foreign department of Rogers, Brown & Co., New York, has returned from a several weeks' trip to far western points.

H. T. Douglas Jr., formerly chief engineer of the Wheeling & Lake Erie railroad, has been appointed chief engineer of the Chicago & Alton railroad.

W. P. Palmer, president of the American Steel & Wire Co., and family are spending a vacation on Grand island, in Lake Superior, near Munising, Mich.

J. Chisholm has been appointed master of bridges and buildings of the Ottawa division of the Grand Trunk railroad, with headquarters at Ottawa, Ont.

W. E. Corey and Edward N. Dickinson have been investigating natural resources of Hungary and Transylvania.

J. H. Johnston has been appointed master of bridges and buildings of the eastern division of the Grand Trunk railroad with headquarters at Montreal, Que.

F. Walter Guibert, 327 Ford building, Detroit, has been appointed sales manager by the Frontier Iron Works,

COL. H. A. MARTING

Buffalo, of their cylinder casting trade in the central west.

Monroe Lemon, with offices, 731 Fulton building, Pittsburgh, has been appointed by the Carnahan Tin Plate & Sheet Co., of Canton, O., as its eastern representative.

P. D. Block, vice president of the Inland Steel Co., Chicago, headed a party that inspected the Thompson mine, Cuyuna range, last week. Others in the party were Samuel Deutsch, H. L. Stern and H. A. Loeb, all of Chicago, and Count Uppenheimer, of Wiesen, Germany.

Leslie R. Thomson, B. A. Sc., lecturer in civil engineering at the University of Manitoba, has resigned to accept a position with the Dominion Bridge Co., at Montreal.

D. A. Carpenter, El Paso, Tex., southwestern agent for the Chicago Pneumatic Tool Co., Chicago, has returned home after an extended business trip in the east.

L. F. Eaton is president of the Penninsular Engineering Co., Detroit, Mich. A site is being cleared for a new plant for the company at Woodward and Erskine avenues.

Prof. J. E. Fitzgerald, formerly superintendent of schools at Wooster, O., has accepted a position in the sales department of the Brier Hill Steel Co., Youngstown, O.

C. F. Kern, of the Kern Machine Tool Co., formerly of Cincinnati, and recently of Hamilton, O., has resigned as the president of that company and has returned to Cincinnati.

Lee Treadwell has resigned his position as vice president and chief engineer of the Union Bridge & Construction Co., Kansas City, Mo., and disposed of his interest in the company.

Prof. S. B. Christy, dean of the school of mining of the University of California, has been re-elected corresponding member of the Institution of Mining and Metallurgy, London.

James Cardle, president of the Vermillion Iron Development Co., Duluth, headed a party of officers and stockholders, who recently inspected the company's properties at Pine Island, Minn.

Cornelius Donovan, principal assistant engineer at the United States engineer's office, New Orleans, has been awarded the honorary degree of Doctor of Engineering by the University of Michigan.

W. W. Fisher, chief engineer of the Standard Underground Cable Co., at Perth Amboy, N. J., was elected president of the Esperanto Association of North America, at its recent convention.

Keyes C. Gaynor, for several years city engineer at Sioux City, Ia., has

MEN OF THE IRON TRADE

resigned to engage in general engineering practice. Mr. Gaynor has opened an office in the United Bank building, Sioux City.

H. P. Davis, treasurer of the Manhattan Drilling Co., manufacturer of the Dobbins core drill, 25 Broad street, New York, has been visiting the Lake Superior iron ranges in the interests of his company.

William H. Larkin Jr., who has been chief engineer of the Herrick Engine Co., West New Brighton, N. Y., has accepted the position of mechanical engineer with the Revere Rubber Co., Chelsea, Mass.

C. P. Ludwig, retained by the receivers as general superintendent and manager of the properties of the Alabama Consolidated Coal & Iron Co., has just completed an inspection of the plant at Gadsden, Ala.

A. E. Jupp, who has been superintendent of the merchant mill of the Colorado Fuel & Iron Co.'s plant at Minnequa, Col., has resigned to become manager of the Harrow Spring Co.'s plant at Kalamazoo, Mich.

Newton Hartford has been placed in charge of several of the merchant mills of the Gautier plant of the Cambria Steel Co., Johnstown, Pa., having been transferred from the company's electrical department.

Ralph Archibald has been appointed superintendent of the Barrows mine, Cuyuna range, owned by M. A. Hanna & Co., Cleveland. The change house at the mine is almost completed, and 80 men are now employed there.

Jon Leo, Niles, O., chief engineer at the plant of the Youngstown Iron & Steel Co., Youngstown, O., who suffered a broken leg and other injuries in a recent accident, will recover, it is said.

E. F. Stroeh has been appointed master mechanic of the Kansas City Terminal division of the Missouri Pacific railroad. He has been master mechanic of the Colorado division with headquarters at Hoisington, Kan.

Frank Briscoe has resigned as vice president of the United States Motors Co., but will continue as president of the Briscoe Mfg. Co., a subsidiary of the former concern. Mr. Briscoe will sail late this month for Europe, where he will remain for a year or more studying the methods of foreign motor car engineers.

George H. Benzenburg, consulting engineer of Milwaukee, Wis., and a former president of the American Society of Civil Engineers, has been awarded the honorary degree of Doctor of Engineering by the University of Michigan.

William B. Melish has been appointed receiver of the Armor Steel Foundry Co., Winton place, Cincinnati. Court action was said to be necessary, owing to the continued illness of John E. Jones, president of the company.

George Price, formerly connected with the Tide Water Building Co., has been made representative in New York of the Flintkote Mfg. Co., and J. A. & W. Bird & Co., Boston, with headquarters at 66 Beaver street, New York City.

William Ruddy, who has been assistant superintendent of the W. A. Wood Mowing & Reaping Machine Co., Hoosick Falls, N. Y., has accepted a position as castings engineer with the Hess Steel Castings Co., Bridgeton, N. J.

F. F. Longley, resident engineer at the filtration plant in connection with the Toronto water works, has resigned his position to become a member of the firm of Hazen & Whipple, consulting engineers and filtration experts, New York.

W. G. Siebert, who has been master mechanic of the Omaha division of the Missouri Pacific railroad, with headquarters at Falls City, Neb., has been appointed master mechanic of the Colorado division with offices at Hoisington, Kan.

George W. Yeoman, formerly associated with the Continental Motor Mfg. Co., of Muskegon and Detroit, Mich., is now vice president and general manager of the Ames Motor Car Co., Owensboro, Ky., which was recently re-organized.

Edwin Abe has been elected president of the Wapakoneta Wheel Co., Wapakoneta, O. The company was only recently organized. Other officers chosen are vice president, W. J. McMurray; secretary, John Taeusch; treasurer, Charles F. Herbst.

J. V. Davison, who went from Toledo, O., to Indianapolis, Ind., to take charge of the plant of the National Malleable Castings Co. about one year ago, has returned to Toledo and assumed management of the branch of the company in the latter city. He succeeds John J. Manning, who was recently killed in an automobile accident.

Col. H. A. Marting, who will head the reorganized Marting Iron & Steel Co., has been connected with the iron and steel industry for a number of years. The new company takes over the former Marting Iron & Steel Co., Ironton, O., the Ironton Iron Co., Ironton, and the Lawrence Iron Co., Culbertson, O. Col. Marting was president and general manager of the Ironton company, and president of the Marting and Lawrence companies. The Lawrence Iron Co. was formerly the Bird Iron Co. and operated the Bird furnace. It was acquired by the present owners in February, 1910.

C. H. Osborn has resigned as assistant superintendent of the car department of the Chicago & Northwestern railway to associate himself with the Mid-Western Car Supply Co., of Chicago, as vice president. He entered the employ of the Chicago & Northwestern in 1895, and after serving as a special apprentice in the mechanical department, filled successively the positions of roundhouse foreman, division foreman, master mechanic and for the past four years, assistant superintendent of the car department. In going with the Mid-Western company Mr. Osborn will have charge of the mechanical department.

Alfred Still has recently been appointed chief electrical engineer to the mining department of the Algoma Steel Co. His headquarters will be at Magpie Mine, Ontario. The company with which Mr. Still is connected is under the control of the Lake Superior Corporation, Sault Ste. Marie, Ontario, and, apart from the complete electric power equipment at both the Helen and the Magpie mines, there is a hydro-electric power station now nearing completion, which will supply power to the mines over an 18-mile three-phase transmission line. Mr. Still is an English engineer, well known as the author of standard books on electrical subjects.

COPPER CLAD SHEETS

To be Manufactured by Metals Company—Other Chester, Pa., News.

The Duplex Metals Co., Second and Lloyd streets, Chester, Pa., manufacturer of steel, copper-clad wire, nails, cable, etc., is completing the installation of equipment for the production of copper-clad sheets and strips to be used for roofing, cornice work, etc. The company is also installing an industrial railway, approximately 500 feet in length, throughout its plant. Two new oil-burning heating furnaces are also being built. This company, which was founded in 1906, has doubled its capacity during each of the last four years.

The Federal Steel Foundry Co., Chester, Pa., reports that it is very busy at present. The plant is bounded on three sides by streets and on the fourth by the Delaware river. Application has been made to the Chester council for the condemnation of one of the streets running to the river and if this action is taken, the company plans to extend its present plant. The Federal company also contemplates replacing its hand-chipping equipment with pneumatic chippers some time in the future.

W. A. Witteman & Co., Broad street, Chester, Pa., manufacturers of drop forgings, have just completed additions which nearly treble the capacity of their plant.

The Delaware River Steel Co., which took over the plant of the Tidewater Steel Co., Chester, Pa., is at present operating only the blast furnace. It is possible that the steel works may again be placed in operation some time in the future, but no definite plans have yet been made in this connection.

Lightning Causes Explosion

Pittsburgh, Aug. 13.—An explosion was caused at the No. 4 blast furnace, Aliquippa works, of the Jones & Laughlin Steel Co., Aug. 9, when lightning struck a high tension wire leading to the pump house. The water supply was shut off, causing the dust catcher and separator to explode. Samuel D. Steele, assistant master mechanic, was struck by a flying piece of iron and killed. The furnace was lighted for the first time last week, and as soon as repairs are made, it will be relighted.

Operates at Capacity.—The Lake Superior Corporation is now operating at capacity with a daily output of 1,000 tons of rails, 1,400 tons of pig iron and 1,500 tons of coke, in addition to other products. Orders now on hand are sufficient to keep the mills busy until the end of the year.

McKINLEY MEMORIAL

Seems Assured as Fund is Still Growing.

Contributions toward the National McKinley Birthplace Association fund to be used for the erection at Niles, O., of a fitting memorial to President McKinley continue to be made in a liberal manner.

Joseph G. Butler Jr., Youngstown, O., who is heading the campaign, is greatly encouraged because of the generous responses he has received to appeals for financial donations. Among those which he cherishes is a check for $100 from President W. H. Taft.

The six days' campaign which was held in Niles was marked with splendid results. At the end of that time subscriptions amounted to about $60,000, said Mr. Butler, who added:

"We are continuing our campaign vigorously, and have every reason to be pleased with our accomplishments. It is our belief that we shall succeed admirably in our efforts. We feel grateful to all who have assisted us in any way whatever, and think they will have occasion to feel justly proud of their activity in such a commendable cause, being, as it is, one of love and patriotic loyalty expressed with characteristic American spirit. We have many promises which are yet to be fulfilled, and expect they will materialize soon now. In this connection I wish to urge the convenience and aid of expediting contributions. It therefore will be appreciated if those who intend to donate will do so as quickly as possible."

Western Steel Corporation Sold

The Western Steel Corporation, Seattle, Wash., advises that it has sold its property to the Occidental Steel Co. of Maine. The Occidental company, which was recently incorporated, has recorded the property at Port Townsend, Wash. The Western Steel Corporation was thrown into the hands of receivers about a year ago by the Metropolitan Trust Co. of New York.

Crozer No. 1 stack of the Virginia Iron, Coal & Coke Co. is expected to blow in in a few days.

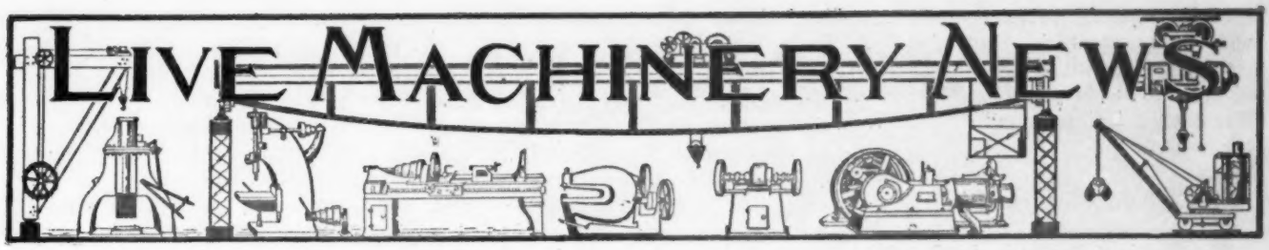
BOOM CONDITIONS

Are Being Realized in British Iron Trade.

Office of THE IRON TRADE REVIEW,
Prince's Chambers, Corporation St.,
Birmingham, Eng., Aug. 3.

Pig Iron.—The prices of Cleveland pig iron have touched a point far beyond anything expected. During the past few days, the market has been stimulated by excellent American reports, and especially by the cable emanating from The Iron Trade Review. There was a net gain of 5d per ton at Cleveland on Friday, and a further 3d yesterday, making the selling figure for cash 59s 8d ($14.60) and for one month 60s ($14.68). The blast furnace men's wages have recently been advanced 2¼ per cent in the north of England, and this week the Cleveland ironstone miners are receiving a similar advance. The boom conditions have been well reflected in the Middlesbrough shipments for July. From the Tees 177,359 tons were exported, of which 111,848 tons were pig iron. Italy was Cleveland's best foreign customer for pig iron. Makers have no stocks and the deficiency has become so marked that five more furnaces are to be blown in in Cleveland, of which three will produce hematite iron. The Cleveland prices are now the best for six years, and makers expect to realize 60s per ton very shortly.

Finished Material.—As a rule the week before the holidays is uneventful and featureless, but this week has been a remarkable exception to the rule. On Thursday, the steelmakers declared an advance of 5s per ton on sections, including channels, tees, angles, etc., making the new minimum for angles £7 15s. An exception was made of joists, but these followed suit yesterday. Makers are finding a tremendous demand, and steel plates have also been advanced 5s, making the selling price £8, less 2½ per cent, for ship plates, delivered at the ship yards on the northeast coast. This represents a rise of 25s during the present year. In the north of England there is an advance of 5s on practically all descriptions of iron. Scotland has not yet followed the example, but will do so shortly. There is still an enormous demand for half-finished steel, with prices continuing at about £6. A few Belgian billets are on offer at £5 13s 6d, and finished mild steel bars are being bought in fair quantities at £6 15s, but the influence of foreign material on the market is comparatively negligible.



The volume of machinery business in the New York market last week was very satisfactory. The character of the business booked was similar to that entered during the preceding week, being mainly in small lots for extensions and replacements to industrial plants. The railroad demand did not figure to any important extent. The largest single inquiry to appear was a list of specifications for machinery to be installed in the Baron de Hirsch Trade school, 222 East Sixty-fourth street, New York City. This list, which calls for 24 machines, having a total approximate value of from $12,000 to $15,000, is expected to be distributed without delay. The Baltimore & Ohio railroad, it is understood, will shortly complete the list of machinery specifications which the trade has awaited for some time, and it is expected that this will appear soon. The board of education at Bayonne, N. J., recently purchased about $6,000 worth of machinery. Contracts have been closed for about $20,000 worth of machinery for the new West Philadelphia High school. It is expected that several additional inquiries for trade school equipment will shortly be submitted to the trade in this vicinity.

In Cleveland, machine tool dealers are well satisfied with the amount of business booked during the first half of August. The number of orders is about equal to that received during July. Inquiries are numerous. This fact accounts for the general feeling of satisfaction among dealers, as none of the inquiries is large. A railroad list for a fair-sized lot was received this week, and dealers are expecting a number of lists from railroads within a few months. The greater portion of the large list of the Lima Locomotive Corporation, Lima, O., has been placed, but the orders have not been confirmed as yet. All lines are affected by the heavier business being transacted.

In Cincinnati, the machinery market is improving. Manufacturers are expecting railroads to put inquiries into the market soon. One large company has recently booked a $60,000 order from Japan, and a large part of the business at present is coming from foreign territory. Milling machines have been in good demand lately, and the Cincinnati Milling Machine Co. is working a night force in addition to its regular day force. Lathe manufacturers are, in most cases, running to 95 per cent of their capacity, and planers are selling better than for some time. The Cincinnati Bickford Tool Co. has taken some good orders recently, and is enlarging its plant. Second hand machinery is not selling as well as expected. Light electrical machinery is being contracted for in good lots by most local manufacturers, a large part of which is coming from nearby territory.

Machine Tools

The C. O. R. Cutter Co., 1181 East Eighty-fourth street, Cleveland, recently incorporated with a capital stock of $36,000, advises that it is a combination of the Nonpareil Reamer Co. and the Corux Co. and will manufacture reamers at present. The present capacity is 20 reamers a day, but this will be increased soon. The company is in the market for a tool room lathe with taper and relieving attachment, one or more milling machines, one or more grinders, one hardening furnace, one back geared drill press with power feed, and two or more lathes, at least one with taper attachment. The company has its own building with lease and room for expansion.

The following list of machinery specifications has been issued for the Baron de Hirsch Trade School, 222 East Sixty-fourth street, New York City:

One 14-inch x 5-foot Hendy engine lathe, geared head with oil and chip pan; taper and relieving attachments and drawn-in attachment with collets; motor driven, etc.

Twelve-inch Prentice high speed engine lathe, 5 or 6-foot bed.

One 1-inch Whitcomb-Blaisdell double back geared engine lathe, 5 or 6-foot bed, taper attachment.

One 13-inch Willard high power engine lathe, 5 or 6-foot bed.

One 14-inch Lodge & Shipley 3-step cone engine lathe.

One 14-inch x 5-foot Reed engine lathe, compound rest, taper attachment, extra set of change gears and double intermediate for metric thread.

One 14-inch Hamilton Machine Tool Co. engine lathe, 5 or 6-foot bed, taper attachment.

One 14-inch American Tool Works 3-step cone engine lathe with 5 or 6-foot bed.

One 14-inch, 5-foot Fay & Scott engine lathe.

One 14-inch LeBlond standard compound rest engine lathe, 5 or 6-foot bed, taper attachment.

One 14-inch Flather & Co.'s quick change feed engine lathe, 5 or 6-foot bed.

One 14-inch Springfield Machine & Tool Co. friction geared head engine lathe with 4-step cone, 5 or 6-foot bed.

One No. 2 Cincinnati plain milling machine, with universal milling attachment.

One No. 2 LeBlond plain milling machine.

One No. 1½ Hendey universal milling machine.

One 20-inch Whitney water tool grinding machine.

One No. 1 Landis universal grinding machine with magnetic chuck and side mill grinding attachments.

One Binsse surface grinder with Walker magnetic chuck, 12 or 14-inches long.

Two 14-inch Gould & Eberhardt shaping machines, back geared.

One No. 2 Warner & Swasey universal turret lathe, back geared, with automatic chuck, etc.

One No. 0 Wm. E. Gang radial drill, with taper sleeves, etc.

One 14-inch Rockford drill press, power feed.

One No. 2 J. G. Blount grinding machine.

Water Works

The board of public works, La Crosse, Wis., will receive bids until Aug. 29 for furnishing the municipal waterworks system. The material for which bids are asked includes 82 tons of cast iron pipe, 3 tons of cast iron specials, 11 fire hydrants, 76 valves from 6-inch to 24-inch. James T. Day, Fred Schnell and George Falk comprise the board.

Power Plant Equipment

Emmett Smith, Chicago, is in the market for equipment to establish an electric light and power plant in Hodgenville, Ky. Negotiations are pending for starting work at Hodgenville.

An electric light and power plant in Glasgow, Ky., which has just been purchased by W. F. Richardson and others, is to be enlarged and improved by the addition of new machinery.

The city of Corydon, Ky., will probably be in the market, for equip-

ment for a municipal electric lighting and power plant, in September. A bond issue of $10,000 for the improvement is to be voted on at that time. The mayor is in charge of plans for the work.

New Construction

The Bickford Tool Co., in the Oakley industrial colony, Cincinnati, is having plans drawn preparatory to enlarging its plant, the new part, 50 x 150 feet, and one story, being used in cleaning and storing castings.

The Rockford Steam Boiler Works, Rockford, Ill., owned by James McCarren, is having plans prepared for a new and larger works to supplant its present one. The new building will be 160 feet long.

The Nordberg Mfg. Co., Milwaukee, has started work on the construction of a new pattern storage house, at Oklahoma avenue and Chicago road. It will be of brick, 60 x 180 feet, estimated to cost about $17,000.

The Dayton Malleable Iron Co., Dayton, O., will erect a factory building on West Second street, between Dale avenue and Summit street. It will be of steel, brick and frame construction and its dimensions will be approximately 150 x 300 feet.

The New Departure Mfg. Co., Bristol, Conn., manufacturer of ball bearings, will erect a three-story addition, 60 x 180 feet. The first floor will be used for offices and the second and third for manufacturing purposes.

The Calhoun Pattern Foundry & Machine Co., a new concern of Houston, Tex., has acquired 270 feet of channel frontage running back 400 feet to the International & Great Northern railroad tracks, and will erect buildings covering the entire area and install a complete plant.

The Columbus Machine & Tool Co., Columbus, O., advises that its new buildings will consist of a large foundry, machine shop, pattern shop, pattern vaults, blacksmith shop, erecting and testing shops, hardening department, etc., for which contracts have been placed. The company will receive quotations during the present month upon an extended list of machine tools.

The American Manganese Bronze Co., New York, advises it has under construction an addition to its foundry building at Holmesburgh Junction, Pa., which will double its present floor space, giving a clear floor of 240 feet served by an electric crane supplemented with trolleys equipped with electric hoists. The company has placed orders for all the new machinery which it will require for the present.

Former Mayor John J. Craig, of Covington, Ky., has been awarded the contract to reconstruct the plant of the Stewart Iron Works Co., that city, recently damaged seriously by fire. The new works will be larger than the old one. One of the buildings will be 100 x 425 feet, another 125 x 225 feet, both three stories, and another 25 x 125 feet and one story. The buildings will be constructed of steel and brick, and will encompass almost an entire block.

The Standard Foundry & Mfg. Co., De Kalb, Ill., is preparing to build an addition, 50 x 160 feet, to its main building. The structure will be used as a foundry, and will practically double the company's capacity. Among the equipment to be installed, it is said, will be a three-motor electric crane for handling large castings, a molding machine, a jolt ramming machine, an air compressor and a sand blast as well as smaller apparatus.

The Greenfield Machine Co., Greenfield, Mass., advises that it recently purchased a tract of about two acres in the northern part of Greenfield and is erecting thereon a one-story building of brick and concrete construction, 100 x 100 feet. This will be used for the manufacture of plain and universal grinders, the company's present product. Very little new machinery will be required as the company will transfer from its present plant about everything that will be needed.

The Quigley Furnace & Foundry Co., recently organized at Springfield, Mass., has purchased two tracts in that city and will begin the erection of a plant for the manufacture of furnaces. The main building will be 300 x 150 feet, one story high and of brick and steel construction. Employment will be given to about 200 men at the start. C. K. Lassiter, superintendent of the American Locomotive Works, Richmond, Va., is president of the new company. Other officers are W. S. Quigley, Rockwell, N. Y., foreman of the Rockwell Furnace Co., vice president; T. R. Ramp, formerly superintendent of the Murray Iron Works, Burlington, Ia., superintendent.

The National Machine Tool Co., Cincinnati, O., advises that its new building will contain about 4,000 square feet. The shop will have a saw tooth roof, and will be built of brick, concrete and steel. The building will be used for the manufacture of the National keyseat miller and oil-groove miller. The plans are already finished and bids have been received, although no contracts have been let. The building will have its own power plant and lighting system besides other modern equipment, such as automatic fire sprinklers, heating system, etc. There will be very little new machinery purchased outside of the engine and generator, now on order. The object of the new building is to take care of the increased business and to manufacture the company's product by modern methods.

Miscellaneous

The Barry Mfg. Co., Muscatine, Ia., advises that it has almost completed the erection of a foundry of concrete and steel construction, 60 x 160 feet.

The city of Hamilton has awarded the contract for two 750-revolution electric pumps to cost $6,000 to the Canada Foundry Co. and for the electrical apparatus to the Canadian General Electrical Co., at $10,475.

J. S. Patterson, Elizabethtown, Ky., is to install a crushing plant and will manufacture limestone for fertilizing purposes. The crusher will be installed at a quarry, which is already in operation.

The Little Automobile Supply Co., Spartansburg, S. C., will install a gasoline and compressed air storage system and a complete vulcanizing plant. S. Craig Little is president of the company.

The Key Calk Mfg. Co., Green Bay, Wis., has started operating its new plant. The company has already reached an output of 1,000 calks per working hour and two tons of shoes every ten hours.

George Gorton, owner of the Gorton Machine Co., Racine, Wis., and inventor of a machine for cutting steel plates and bars, has received an order for 50 of these devices from the Carnegie Steel Co., which has been making tests for some time past.

Vandyck, Churchill & Co. will furnish the machinery and tools for the manual training department of the new West Philadelphia high school. The order amounts to about $20,000. The Diehl Mfg. Co. will supply the electric motors.

The Massillon Rolling Mill Co., Massillon, O., advises that it proposes to increase its plant by the installation of one additional hot mill, making 10 in all. The company is also increasing its cold rolled finishing capacity by 100 per cent, enabling it to take care of the increased business on automobile and polished sheets for range works to the better satisfaction of customers.

New Buyers

(In order to assist the post office in delivering letters to new concerns, it is suggested that the names of incorporators be written in the lower left hand part of every envelope addressed to such new companies.)

The following manufacturing companies have filed articles of incorporation:

Fletcherite Metal Co., Wilmington, Del.; $150,000; by E. McWhiney, Wm. J. Maloney, both of Wilmington.

South Bend Boiler Works, South Bend, Ind.; $7,500; by directors, J. D. Hunter, Fred Swingendorf and William H. Freyermuth.

Liquid Forged Steel Co., Cleveland; $10,000; steel and other metals; by A. F. Kwis, E. B. Gilchrist, E. L. Thurston, E. L. Brennen, E. M. Freeman.

National Tack Co., Boston; capital stock $50,000; by directors, Lamont Pratt, president; Bernard C. Pratt, treasurer, and Edward S. Cogswell.

Blake Automobile Co., Cambridge, Mass.; capital stock $100,000; by directors, E. C. Blake, treasurer; L. E. Gibson and Batista Vitalini.

Tulsa Stove & Foundry Co., Tulsa, Okla.; $60,000; by A. C. Spitznagle, F. D. Prentice, of Tulsa, and H. E. Bartlett, of Sand Springs.

The Cleveland Railway Equipment Co., Cleveland; $1,000; by A. R. Manning, D. E. Mook, E. S. Cook, B. Chesnutt.

Champion Iron Mfg. Co., Checotah, Okla.; $25,000; by R. O. Smith, Checotah; A. Rosenbraugh, J. M. Lamming, of Muskogee.

Pratt Drop Forge & Tool Co., Shelburne, Mass.; capital stock $25,000; by directors, William M. Pratt, president; Charles D. Severance, Greenfield, treasurer, and Francis R. Pratt.

Cooke-Wilson Co., Cleveland; $50,000; electrical and electro-mercantile appliances; by A. E. Calland, B. W. Gearheart, O. E. Davis, Charles I. Steuffer, E. G. Bowerman.

Phillips Heater Mfg. Co., Boston; capital stock $25,000; by directors, William W. Phillips, president and treasurer; Samuel N. Cohen and Annie R. Phillips.

Charles A. G. Winther Co., Boston; to manufacture and deal in tools; capital stock $5,000; by directors, Charles A. G. Winther, president; William F. C. MacKay, treasurer, and Mary A. MacKay.

True Form Fillet Co., Buffalo; $10,000; pattern makers' and foundry supplies; by Jacob D. Schakel, Harvey E. Herr, Frank D. Reigle and Theodore Krug.

General Power Co., Boston; to manufacture light, power, etc.; capital stock $50,000; by directors, John E. Hill, president; Frank A. Peacock, Portland, Me., treasurer, and Joseph Lovejoy.

Elliott Motor Engine Co., Boston; $300,000; to manufacture engines; by Gilbert R. Elliott, Dorchester; Frank P. Harris, Waltham; W. C. Cogswell, Barristers Hall, Boston.

John D. Cox Co., Springfield, Mass.; to manufacture and deal in heating and plumbing apparatus; capital stock $10,000; by directors, Burdette M. Bancroft, president; John C. Cox, treasurer, and Walter B. Russell.

Central Garage & Supply Co., Ltd., Toronto, Ont.; capital, $150,000; to manufacture automobiles, engines, etc.; provisional directors, Robert B. Haley, Ernest S. Benyon and Roydon J. Haley.

The Emo Iron Mine & Development Co., Ltd., Emo, Rainy River district, Ont.; capital, $200,000; provisional directors, John H. McDonald, Hamilton, T. Hunter, Edward W. Wright and others.

The Rapids Power Co., Ltd., Toronto; capital, $200,000; to generate electricity and carry on business as contractors, etc.; provisional directors, Wm. G. Thurston, Edward W. Boyd, James L. Sharkay and others.

General Industrial

The Dominion Bridge Co., Montreal, Ont., has increased its capital stock to $10,000,000.

The Trumbull Steel Co., Warren, O., has increased its capital stock from $1,000,000 to $1,250,000.

The Janesville Machine Co., Janesville, Wis., has increased its capital stock to $750,000.

The Havers Motor Car Co. has purchased the plant of the E. M. F. Studebaker Co., Port Huron, Mich.

The Marshfield Iron Works, Marshfield, Wis., has been obliged to put on a night force in order to increase production and fill its orders. The company's gasoline motor business has been growing rapidly and extensions of the plant may be necessary before the end of the year.

J. M. Downing and G. H. Spackman have been appointed receivers for the Wilmington Wheel Mfg. Co., Wilmington, Del.

Work has been started on the new boiler shops of the New York Central railroad at Avis, Pa. The steel contract for the work was awarded to the Lackawanna Steel Co.

The New Castle Steel & Iron Co., recently incorporated, advises that nothing has been done as yet in the way of acquiring a property or building a plant.

The Moline Wagon Co., Moline, Ill., owned for some time by Deere & Co., also of Moline, advises that it recently changed its name to the John Deere Wagon Co.

The Thomas B. Jeffery Co., Kenosha, Wis., has purchased nine acres adjoining its present works for future extensions. No definite plans have been announced.

The Veneer Pail & Machine Co., and the Veneer Barrel & Machine Co., Omaha, each with $150,000 capital stock, have been organized by the same incorporators for both concerns.

The Insley Mfg. Co., Indianapolis, whose plant was seriously damaged by fire, advises that it has leased a site temporarily until plans can be made for rebuilding.

The Rudolph Brake Co. has been organized with a capitalization of $10,000, in Paducah, Ky., to manufacture a patented brake invented by R. E. Rudolph, of Paducah.

The Philadelphia Textile Machinery Co., Philadelphia, has completed plans for the erection of a two-story plant, 225 x 275 feet, at Sixth street and Tabor road, that city.

A portion of the old Vulcan Works, Chester, Pa., which has been idle for many years, has been leased temporarily by the Federal Steel Foundry Co., that city, for the storage of patterns.

Additional buildings for the Ames Motor Car Co., Owensboro, Ky., are to be erected and equipped for automobile manufacture, according to a recent announcement by F. A. Ames,

president of the concern. The plant is to be enlarged to an annual capacity of 2,000 cars.

The Wadewitz Machinery Co. has been organized by A. H. Wadewitz, Racine, Wis., to manufacture machinery. The company has been incorporated with an authorized capital of $25,000.

The Engineering Appliance Co., Covington, Ky., recently incorporated, advises that it is engaged in engineering and caters to the water plant, electric light plant and ice plant conveniences for country homes.

The McClintic-Marshall Construction Co. has completed the erection of structural iron on the new buildings of the steel car department of the Middletown Car Co., Middletown, Pa. The plant is expected to be completed within 30 days.

The Dominion Bridge Co., of Montreal, has secured a new charter of incorporation, increasing its capital stock to $10,000,000. The company is primarily interested in the contract for the Quebec Bridge superstructure, which is in the hands of the St. Lawrence Bridge Co.

The Merchant & Evans Co., Philadelphia, is remodeling the plant formerly operated by the West Virginia Bridge & Construction Co., at Warwood, a suburb of Wheeling, W. Va. Machinery will be installed for tinning black plate and for manufacturing the company's extensive line of specialties.

Capitalized at $150,000, the Valley Machine Co., Parkersburg, W. Va., has been incorporated and will operate a plant employing a large number of men, it is said. The incorporators are: B. B. Putnam, Dayton, O., and Ferguson O'Connor, R. G. Stiles and John Marshall, Parkersburg.

The Mechanical Process Mfg. Co., Toledo, O., has been incorporated with a capital stock of $10,000, to manufacture machines, tools and mechanisms. The incorporators are Albert H. Smith, Walter Stewart, Isaac Kinsey, R. Scott and J. E. Kepperly.

The Chicago Brass & Bronze Co. has leased the old Wisconsin Central car shops at Waukesha, Wis., and will install its shops there. The plant is expected to be ready for operation by next spring. The shops leased comprise four buildings, one 113 x 275 feet and three, 60 x 90 feet each.

A new Y. M. C. A. building will be built in Hamilton, O., about 10 stories, with a framework of steel. Plans are being prepared and will be ready in a short time. J. C. Cullen, president of the Niles Tool Works, of that city, is chairman of the committee in charge of the construction of the building.

The H. A. Steiner Co., Chilton, Wis., manufacturer of gasoline engines, stationary and traction, is negotiating with the Business Men's Association of New London, Wis., for the re-location of its plant. The company has a working capital of $32,000 and asks that citizens of New London provide enough additional capital to make it $50,000.

The Copper-Clad Malleable Range Co. has leased the four-story building at 515 North Levee and 520 and 522 North Commercial street, St. Louis, for five years, and will use it for manufacturing, storage and salesrooms as soon as the reconstruction work now under way is completed. The company will equip the premises for a capacity of 60 ranges a day. The new building will be ready for occupancy in about three weeks.

The Folberth Carburetter Co., Youngstown, O., has been incorporated with a capital stock of $70,000 by E. A. Hegg, E. A. Emery, E. A. Tobey, Joseph F. Williams and Thomas L. Morgan. The company will make a specialty of a patented carburetter invented by D. F. Folberth, Cleveland. The factory will be located in Youngstown and, it is said, will give employment to about 40 skilled hands at the start.

The Pfau Mfg. Co., Milwaukee, recently incorporated, advises that it is manufacturing air compressors, pneumatic pumps and electric controllers, which it uses in connection with the Pfau pneumatic water system. An extra heavy air reservoir is used in connection with each plant. The company's business is growing rapidly. It is exhibiting its product at the Iowa, Illinois, Wisconsin and Minnesota state fairs.

The South Bend Boiler Works, South Bend, Ind., just organized, has taken over control of the Mathews Steam Boiler Works of that city. The new company is capitalized at $7,500. While the manufacture of steam boilers will be a specialty, manufacturers' tools, iron machinery, structural work and transmission pulleys and shafts will also be made. Incorporators and directors are William H. Freyermuth, Fred Swingendorf and John D. Hunter.

The Romeo Foundry Co. has leased the old malleable iron works known as plant No. 3 of the Port Huron Engine & Thresher Co., at Port Huron, Mich., and there will cast motor cylinders and piston rings, exclusively for the Ford Motor Car Co., Detroit, Mich. The Romeo company employs 125 men at present, and the number is expected to be increased to 150 when it starts up at Port Huron. A. L. Holmes is president of the company.

The Columbus Machine & Tool Co., Columbus, O., recently incorporated with a capital stock of $500,000, has purchased the entire business of the Columbus Machine Co., Columbus, and the Vulcan Furnace Co., Warren, O. Contracts have been placed for the construction of an entirely new and modern manufacturing plant in Columbus, in which the company will manufacture gas, gasoline, and oil engines up to 600 horsepower, mechanical stokers, shaking grates, pipe machines, bolt machines, piston machines, etc. Machine tools and power orders have not yet been placed. Until completion of the new plant, manufacture is being conducted in the plant of the Columbus Machine Co. D. H. Palmer is president of the organization.

Trade Notes

The American Rolling Mill Co., Middletown, O., has established a New York sales office at 551 Hudson Terminal building, 50 Church street.

Fires

Damage estimated at $20,000 was caused by fire recently at the Panhandle Motor Co.'s offices, garage and shop at Amarillo, Tex.

The plant of the Abram Cox Stove Co., at American and Dauphin streets, Philadelphia, was damaged by fire, Aug. 7, to the extent of $25,000. The fire was first discovered in the core room of the foundry in the basement and for a time threatened to destroy the entire plant in which is combined the foundry, warehouse and offices.

The Sheriffs Mfg. Co., 128 Barclay street, Milwaukee, Wis., sustained a loss estimated at $12,000 by fire on Aug. 8. The company makes patterns for marine engines and marine castings of all kinds, including propeller wheels, shafts, etc. Among the patterns destroyed were those for a 160-horsepower motor for a new fire tug.

The foundry of the Belcher & Taylor Agricultural Tool Co., Chicopee Falls, Mass., was destroyed by fire, Aug. 10. President Frederick N. Witherell estimates the loss at $30,000. The building was of mill construction, 100 x 45 feet, one story. Plans for the erection of a new foundry building will be prepared at once. The fire, which was of unknown origin, destroyed many patterns for farm machinery.